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## Twenty-fifth Year

# FALL AND SPRING BULLETIN ~ 1945-46

GRADUATE SCHOOL  
UNITED STATES DEPARTMENT OF AGRICULTURE

## Graduate and Undergraduate Study for Federal Employees

WASHINGTON ~ AUGUST 1945

*This Bulletin covers graduate and undergraduate programs for Fall and Spring Semesters. A special Graduate Bulletin concerned with graduate programs only is available on request. A special bulletin on correspondence study is likewise available.*

## Calendar for the School Year 1945-46

### Fall Semester

- September 10 to 22—Registration
- September 17 to 21—Counseling available
- September 24, Monday—Fall Semester begins
- September 24 to 29—All classes begin unless other date is given in Time Schedule Bulletin
- October 6—Last day of registration for credit
- October 6, Saturday—End of refund period and last day of registration without payment of extra fee
- November 2—Last day to make deferred payments
- November 22, Thursday—No classes; Thanksgiving holiday
- December 22, Saturday—Christmas holidays begin; no classes
- January 7, Monday—Classes resume after holidays
- January 18, Friday—Close of Fall Semester \*

### Spring Semester

- January 21 to February 2—Registration
- January 28 to February 1—Counseling available
- February 4, Monday—Spring Semester begins
- February 4 to 8—All classes begin unless other date is given in Time Schedule Bulletin
- February 9, Saturday—End of refund period and last day of registration transfer without payment of extra fee
- February 16, Saturday—Last day of registration for credit
- March 16, Saturday—Last day to make deferred payments
- May 17, Friday—Close of Spring Semester \*

\* Classes which have missed sessions for any reason will continue until deficiency is made up.

Business Office—Room 1031, South Agriculture Building  
Between 12th and 14th on Independence Avenue, SW.

Hours—9:00 A.M. to 6:20 P.M. (1 P.M. Saturday)

Telephone—Republic 4142, Extension 6337

UNITED STATES DEPARTMENT OF AGRICULTURE

*Graduate School  
Bulletin*

1945 - 46



Please preserve this catalog for use in  
the Spring Semester also. New copies  
will not be available in the Spring.

WASHINGTON ~ AUGUST, 1945

## Administration

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FREDERICK V. WAUGH, Ph.D. .... Department of Social Sciences

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\* Resignation effective September 1, 1945.

## General Information

### HISTORY

"I believe those who may be able to avail themselves of this opportunity will both enrich themselves and enhance the value of the service they render."—Secretary Henry C. Wallace (1921)

It was in this spirit that Secretary Henry C. Wallace announced the establishment of the Graduate School in 1921, a self-supporting, non-profit institution, constituting a center of learning for Federal employees after official working hours. Its purpose was to increase employee usefulness. It was to improve the service. Although intended primarily for the Department of Agriculture, its classes were immediately opened and have since remained open to all qualified Federal employees. Thus came to fruition an idea that had been discussed in Government circles, particularly among the scientific personnel of the Department of Agriculture, for a quarter of a century. The Bureau of Standards had provided advanced instruction in certain technical fields since 1908. The Congressional Joint Commission on the Reclassification of Salaries in 1920 pointed out the obligation of the Government to provide more adequate training. The new institution was founded on more than two decades of deliberation and experimentation.

From the beginning, graduate study has been emphasized, as the name indicates, but also from the beginning undergraduate opportunities have been provided as needed. From ten courses in 1921-1922, the curriculum has grown to approximately 200 courses offered each year. From an instructional staff of ten, the faculty has increased to more than 180 (exclusive of assistants and special lecturers). From an enrollment of 213 students in its first year, the School has grown to more than 5,500 in 1944-1945. Students are drawn from every important agency of the Federal Government.

### OBJECTIVES

In a quarter-century of experience in meeting the changing educational needs of Federal employees the School has become a unique educational institution. It is devoted exclusively to the needs of the Federal Government. It does not grant degrees, but stimulates post-entry education of Government employees in all possible ways, in the expectation that some, particularly at the graduate level, will arrange for the completion of their programs at regular degree-granting institutions. The School exists to provide intellectual ferment and a spur to self-improvement in the Federal "bureaucracy." It is, in effect, (1) a graduate school, (2)

an in-service training agency, and (3) an adult education organization. These functions are implicit in the objectives prescribed for the School:

1. To supplement in-service training programs, conducted on government time and at government expense, by making it possible for employees to train themselves both intensively and extensively for proficiency in their present positions and for advancement to better positions.
2. To make available to career employees the opportunity to advance educationally, continuously and progressively, as they advance in job proficiency and responsibility.
3. To provide graduate education acceptable in graduate institutions for the convenience of employees who desire advanced degrees but find it difficult, both for personal and official reasons, to complete all study in residence at the degree-granting institution.
4. To provide certain cultural, creative, and leisure-time opportunities for employees.
5. To assure the attainment of these objectives by making available to employees the experience, knowledge, and instructional talent of outstanding specialists in the Federal service.<sup>1</sup>

The entire program of the School is based on the belief that work and study can be combined to the advantage of both, work giving meaning and motive to the learning process, and study supplying understanding and competence to the work situation. The School also operates in the conviction that, inasmuch as after-work activities and off-the-job environment have a vital relation to morale and performance on the job, the public interest is served by providing Federal employees with broad opportunities for continuation study along the lines of their *general* interests as *individuals* as well as their *special* interests as *employees*. Courses, as a result, range from the cultural to the vocational, without exclusive emphasis on either.

#### AUTHORITY

Congress has authorized the use of Government facilities for study and research by qualified individuals, students, and graduates of institutions of learning in the several states and in the District of Columbia under rules and regulations set up by the heads of departments and bureau chiefs. It was under this authority, combined with the provisions of the organic act of the Department, that the Graduate School was organized. It is governed by Departmental regulations made pursuant to these Acts.

<sup>1</sup> United States Department of Agriculture "Regulations Governing the Graduate School Promulgated Pursuant to the Authority Contained in the Act of April 12, 1892, and the Deficiency Act of March 3, 1901 (20 U.S.C. Sec. 91)."

### ADMINISTRATION

The government of the School is vested in a General Administration Board, appointed by the Secretary of Agriculture. The School is administered by a Director, appointed by the Board, and a small administrative staff. Eight committees named by the Board, one for each major division of the School, advise the administration concerning educational matters in their respective fields. Neither Board members nor committees receive compensation. The School receives no Federal funds. Its operating expenses, reduced to a minimum by the use of Government buildings and facilities, are paid entirely from small course fees.

### ROLE IN THE DEPARTMENT

Enhancement of morale and competence among employees of the Department of Agriculture and other Federal agencies is the chief justification for the Graduate School. In recent years from nine to twelve per cent of the Department's employees in Washington have been enrolled in the School annually. The cumulative effect of this influence, year after year, is readily apparent. The School contributes substantially to forward-looking personnel administration by supplying opportunities to escape blind-alley positions, to prepare for promotions, to find creative after-hours outlets, to escape from office routines, to cultivate genuine interests, to gain self-improvement, to find intellectual challenges equal to one's capacity, to keep abreast of an entire field or series of fields of knowledge when the daily job may require knowledge of only one small segment of a single field, and to understand and appreciate relationships between one's own special task and the tasks of others. The relation of this program to Departmental management is recognized by Secretarial Memorandum, which names the Director of Personnel as *ex officio* Chairman of the General Administration Board of the School.

The School supplements Departmental in-service training programs, elaborates upon them, and carries on from where they end. Training conducted on Government time is likely to be confined to immediate needs, to knowledge and skills which will give reasonably definite direct returns to the Government. The Graduate School offers a no less vital service to the Government, although the results may be more indirect and intangible. The School opens avenues for long-run advancement which training officers, for financial and other reasons, are unable to offer at Government expense. In-service training programs emphasize primarily, if not exclusively, the training needs of management, while the

Graduate School meets the needs of employees, many of whom wish to prepare themselves for professional promotions beyond the interests and jurisdiction of the training offered in the agencies in which the employees are working.

#### FACULTY

The tradition of a strong faculty in the Graduate School dates from its first year. The following men comprised the initial staff of ten:

##### *Natural Sciences*

- \*Dr. C. O. Appleman, now Dean of the Graduate School, University of Maryland.
- \*Dr. Burton E. Livingston, now Professor Emeritus of Plant Physiology, Johns Hopkins University.
- \*Dr. C. L. Shear, now retired; formerly Principal Pathologist in charge of Mycology and Disease Survey, U. S. Department of Agriculture.
- \*Dr. Richard C. Tolman, now Dean of the Graduate School and Professor of Physical Chemistry and Mathematical Physics, California Institute of Technology.
- \*Dr. Edgar T. Wherry, now Professor of Botany, University of Pennsylvania.
- \*Dr. Sewall Wright, now Burton Distinguished Service Professor of Zoology, University of Chicago.

##### *Social Sciences*

- Dr. Alexander E. Cance, now Professor Emeritus of Economics, Massachusetts State College.
- Dr. Henry C. Taylor, now Director of the Farm Foundation; formerly Chief, Bureau of Agricultural Economics.
- Mr. Howard R. Tolley, now Chief, Bureau of Agricultural Economics.
- Dr. Oscar E. Stine, now Head, Division of Statistical and Historical Research, Bureau of Agricultural Economics.

The School has always emphasized the human, non-physical element—teachers and students—in the educational process. The faculty is drawn almost entirely from the Federal service, a source of talent and expertness unexcelled anywhere in the nation. Professional competence is the sole criterion of selection. Faculty members combine excellent academic training, college teaching ex-

\* Starred in *American Men of Science* for distinction in his special field.

perience, and daily practice in the application of the subject matter taught. The only exception to this pattern of qualifications is found in a few cases obviously requiring greater emphasis on technical experience than on academic backgrounds. (See Faculty section on page 78.)

#### GRADUATE DEGREES

The Graduate School does not grant degrees because, as Assistant Secretary E. D. Ball wrote in 1921, "all of this educational work has for its basis the hope that it will inspire the student to still further educational efforts and finally to completing his work at some recognized institution."

*Master's Degrees.* Degree-granting institutions will generally permit six semester hours of graduate credit to be transferred from another institution, including the Graduate School of the Department of Agriculture. Some institutions, including some in the District of Columbia, require that all study for the Master's degree be taken in residence. In some institutions more than six hours may be transferred from the Graduate School of the Department of Agriculture when the additional work is taken with the approval of the head of the student's major department and the graduate dean in the degree-granting institution.

*Doctor's Degrees.* Almost universal academic practice permits the graduate student to complete two of the three years' work necessary for the doctorate outside the degree-granting institution, or a year beyond the Master's degree. The last year must be taken in residence.

*Undergraduate Deficiencies.* Graduate schools generally permit deficiencies to be made up out of residence. Those students who have deficiencies pointed out by their graduate deans may make them up in the undergraduate courses offered by the Graduate School of the Department of Agriculture.

*Consultation with Graduate Deans.* Graduate students should arrange their programs in advance through the dean of the graduate school of the institution from which the student contemplates taking his degree. The latest catalogs of colleges and universities are available for examination in the Department of Agriculture Library.

More complete information about graduate study is given in a special Graduate Bulletin, available on request.

#### CERTIFICATION

*Inclusion in Personnel Record.* To aid its promotion-from-within policy, the Department of Agriculture has provided that

Graduate School credits earned by its employees will be placed in official personnel files. Personnel Circular No. 144, September 22, 1944, provides:

- A. In order that supervisors or others seeking qualified candidates for vacancies may know that a given employee has completed courses in the Graduate School, it is desirable that a record of such course completion be included in the employee's bureau personnel file and the personnel file maintained by the Central Office of Personnel. The inclusion of such information is of great importance in effecting the Department's promotion-from-within policy.
- B. To accomplish this purpose the following procedure will be used:
  1. Unless specifically requested by the employee that such action not be taken, the Graduate School will forward, upon completion of courses or at the end of the year, two copies of the student's record, without cost to the employee, to the personnel officer of the administration, bureau or office in which the student is employed.
  2. The bureau concerned will dispose of the copies as follows:
    - a. Place one copy in the employee's bureau personnel file.
    - b. Transmit one copy to Division of Employment, Office of Personnel, for inclusion in the employee's official personnel file.

*Certification on Request.* Upon a student's written request, an official certification bearing the seal of the Graduate School will be sent to him or to an organization designated by him. The fee for this service is 50 cents a copy prepaid. (Note: Students who desire a certification of work done prior to the academic year 1941-42 must comply with certification rules in effect at that time.) Certification of record for academic credit to be transferred to a college or university will not be made unless the student has filed with the Graduate School a transcript of his previous academic work. (See Academic Credit below.)

#### CREDIT AND GRADES

*Academic Credit.* Persons registering for academic credit must satisfy all prerequisites for admission to the course, as specified in the course description.

Students who wish to transfer graduate or undergraduate credit to a college or university or to the United States Civil Service Com-

mission must file with the Graduate School an official record indicating a bachelor's degree (for courses carrying graduate credit), or satisfactory completion of at least fifteen units of high school work (for courses carrying undergraduate credit). Such records become the property of the Graduate School.

The United States Civil Service Commission accepts Graduate School credits, the same as those from recognized colleges and universities, for examination and qualification purposes. Although courses are of standard graduate and undergraduate grade for the levels indicated (with the exception of a few non-credit courses given to meet special training needs of Federal employees), the School does not grant degrees and has never sought that authority. It prefers to cooperate with existing institutions having that function. Students who wish credit transferred must, of course, meet in all particulars the requirements of the institution to which credits are to be sent. These may, in accordance with growing practice, sometimes call for qualifying examinations for advanced credit. However, certifications of Graduate School work have been accepted for the past twenty-four years by many of the leading colleges and universities. Because of the special conditions under which the School operates, it has never asked, and never felt it necessary to ask, to be included on the lists of accrediting associations. For acceptance of its credits, it relies on the merits of its courses and on the caliber and well-known competence of its instructors. Methods, grades, and credits are without significance unless they result in demonstrated knowledge, skills, and attitudes and in real ability to make effective application. Course requirements and examinations for credit are planned accordingly.

*Audit.* A student registering as an auditor receives full privileges of class participation if he chooses to exercise them. He does not receive a grade; he receives only a mark of AUD. He is not expected to take examinations and is not held responsible in any other way for meeting standards expected of credit students.

*Grades.* Students registering for credit will receive written notice by mail of grades received. Students should keep the School office informed of changes of address.

#### CERTIFIED STATEMENTS OF ACCOMPLISHMENT

In three fields—statistics, public administration, and accounting—the Graduate School offers Certified Statements of Accomplishment upon the student's completion of specified programs of study. (For complete details see the Departments of Public Administration and Mathematics and Statistics.) These Statements are offered to

encourage the student to complete a well-rounded approach to his chosen field of study and work, so that he may more competently discharge his present and prospective responsibilities as a public servant.

#### LIBRARY FACILITIES

The Department of Agriculture Library, containing approximately half a million books, is open to Graduate School students from 8:30 a. m. to 8:30 p. m. Through that Library, the School also has ready and convenient access to unexcelled special libraries.

#### LIBRARY ASSISTANTSHIPS

Library assistantships in limited number are open to qualified students from the Department of Agriculture who wish to use this method of paying their fees. All work is done after official hours. Students interested should inquire at the School Office.

#### FELLOWS AND INTERNS

Each year the Department of Agriculture, in cooperation with the Department of State and the Office of Inter-American Affairs, provides to some sixty or eighty representatives of the other American republics graduate fellowship opportunities for study, observation, and training in the United States. The program is designed to provide additional training for serious, competent scientists and professional men in the improvement of agriculture and living conditions in the Americas. Its aim is to develop public-minded leaders who are able to carry full public and professional responsibilities. The Graduate School cooperates in this undertaking by granting honorary graduate fellowships to all of these students from the other American republics. The School also participates in the Departmental committee that formulates the general programs for this group.

The National Institute of Public Affairs works with colleges and universities and with Federal agencies in Washington in providing annually an internship program for a group of college graduates, competitively selected from the country at large. The Department of Agriculture for several years has cooperated in this undertaking by furnishing selected training and internship opportunities for trainees from the Institute. The Graduate School cooperates by granting to such interns, whether in the Department of Agriculture or in other Federal agencies, graduate fellowships for study in the School.

### CORRESPONDENCE WORK

The Graduate School offers a limited number of correspondence courses intended primarily for the benefit of field employees of the Department of Agriculture. Other Federal Government employees are admitted as staff and facilities permit. Plans are in progress for expansion of this type of education. Persons who are interested may write the School for a special announcement covering correspondence study.

### LECTURES AND PUBLICATIONS

At least one lecture series dealing with a major current problem is offered each year. Last year various aspects of "Organizing for Peace" were discussed by eight distinguished speakers: Sir Willmott Lewis, Nathaniel Peffer, Pitman Potter, Jacob Viner, Hanson Baldwin, Derwent Whittlesey, James W. Fulbright, and André Geraud (Pertinax). A special announcement to be issued later will give details concerning lectures for this year. Several of the lectures of previous years, and a few other valuable works, are available as Graduate School publications. (See list on outside back cover.)

### COUNSELING SERVICES

To aid students in planning their education and training, several Departmental Educational Counselors have been designated by the Department of Agriculture to represent major fields of study and work. These persons, outstanding in their respective fields, serve also as members of the departmental committees of the Graduate School and may be consulted by students from outside the Department of Agriculture. They are always available for consultation on educational plans, whether to be pursued in the Graduate School or in other institutions. A list of these Counselors may be obtained from the Graduate School.

Each bureau and office of the Department of Agriculture has designated an educational counselor to advise with its own employees. The names of these counselors may be secured from the bureau or office in question; field employees may address their educational counselors in care of their organizations.

Officers of the Graduate School are available for consultation throughout the year. Conferences with graduate students seeking advanced degrees are especially welcome.

## REGISTRATION REGULATIONS

*Opening Date.* The twenty-fifth year of the Graduate School opens on Monday, September 24, 1945. All classes begin during the week starting on that date. The fall and spring semesters run fifteen weeks each.

*Admission.* Admission to courses in the Graduate School is open to all qualified employees in the Federal service, and to such other qualified individuals as facilities will permit. Admission to correspondence courses is open only to Federal employees.

*Planning Your Program.* During the period from September 17 to September 21 (from 5:30 to 6:30 p. m.) representatives of the major departments of the School will be available for consultation on courses and programs of study. At other times members of the School staff will be glad to provide assistance.

*Registration.* Registration should be made at the earliest opportunity in Room 1031, South Building, Department of Agriculture. After Saturday, October 6, students may enroll for credit only with the approval of the instructor and the Director. Mail registration forms will be supplied on request. Registration is not completed until the required fees have been paid. When the limitation set for each course is reached, registration for that course is closed. The Graduate School reserves the right to cancel any course if registration does not warrant continuance.

*Late Registration Fee.* Students who register after October 6 must pay a late registration fee of \$1.00 a course. This does not apply to persons who submit evidence that official Government action prevented their registration prior to that date.

*Fees.* Unless otherwise stated, fees are computed at the rate of \$6.00 a credit hour for undergraduate courses, and \$7.00 a credit hour for graduate and the most advanced undergraduate courses. The fee for auditing a course is the same as that charged for credit.

*Partial Payment Plan.* Arrangements may be made at the time of registration for payment in two installments, for which there will be an additional service charge of \$1.00 for each course. The first installment of not less than half the full fee, plus the \$1.00 service charge, must be paid at the time of registration. The second and final installment must be paid on or before November 10. Failure to pay will result in automatic suspension from the course.

*Refunds.* Students withdrawing from classes will not be entitled to refund except that—

1. When a student is granted permission to withdraw from a course on or before October 6, his fee, minus a \$3.00 registration charge, will be refunded.

2. When a student is OFFICIALLY transferred out of the Washington area or leaves Washington to enter the armed forces, his fee, minus a \$3.00 registration charge for each course, will be refunded in the amount proportionate to the unexpired portion of the semester, provided written evidence of such transfer or induction is presented. This does not apply to cases arising out of the student's voluntary action.

All adjustments are made as of the date on which application for refund is received.

*Room Schedules.* Room schedules for classes will be posted after September 19 on bulletin boards outside Room 1031, and in the north entrances of the fourth and seventh wings of the South Building.

# Department of Biological Sciences

## DEPARTMENTAL COMMITTEE

HOWARD P. BARSS, M.S., Principal Botanist and Experiment Station Administrator, Office of Experiment Stations (Chairman)  
F. C. BISHOPP, Ph.D., Assistant Chief, Bureau of Entomology and Plant Quarantine  
M. A. McCALL, Ph.D., Assistant Chief, Bureau of Plant Industry, Soils, and Agricultural Engineering  
BENJAMIN SCHWARTZ, Ph.D., Chief, Zoological Division, Bureau of Animal Industry  
R. Y. WINTERS, Ph.D., Research Coordinator, Agricultural Research Administration

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*Course Numbers and Symbols*—Below 100, non-credit; 100-499, undergraduate; 500-699, graduate and advanced undergraduate; above 699, graduate. Bracketed numbers, not given this year.

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## 206. Useful Plants of the American Tropics

Fall, 3 credits

F. RAYMOND FOSBERG

The aim of the course is to give the student a better comprehension of the relation of tropical plants to the economy of the people of tropical America and to our own national welfare. Special emphasis will be placed on plants essential as a supplement to our own agriculture. Previous botanical training not necessary.

## 207. Land Management Ecology

Fall, 3 credits

EDWARD H. GRAHAM

Treats the biological principles applicable to major types of land management. Emphasis is placed upon those elements of both plant and animal ecology which apply to the use of land resources—soil, crops, range, forests, inland waters, and wildlife. Primarily lecture work, with a variety of illustrative material, but a few local field trips are taken, weather and other conditions permitting. Original sources are used in large part, although Graham's *Natural Principles of Land Use* serves as a general text. The course is designed especially for those without extensive biological training who are interested in obtaining an ecological approach to forestry, range management, wildlife management, soil conservation, and general techniques of land use.

## 212. Introduction to Farming

Fall, 4 credits. Repeated in Spring

EARL R. GLOVER

This course is a brief survey of the fundamentals of farming and includes an evaluation of farming as an occupation and the land, labor, capital, and managerial ability required; the importance of climate, topography, soil, and water and their effect upon farming; an analysis of the types of farming and farming regions; opportunities in American agriculture and how to get started; the importance of farm planning and farm management; tools, buildings, and the farm home; the fundamentals of livestock production; animal breeding; livestock feeding and care; and the economic importance of livestock in the farm business.

**209. Systematic Botany**

Year, 2 credits each semester

SIDNEY F. BLAKE

Intended to give those with no previous experience in systematic botany an acquaintance with the elementary principles of the subject sufficient to enable them to use the ordinary manuals to advantage. The second semester is devoted to the identification of wild plants of this region by the use of a manual. One or two short field trips will be held.

**557. History of Biology**

Year, 2 credits each semester

MORRIS C. LEIKIND

A lecture and discussion course on the historical foundations of modern biology. The first semester will be devoted to an outline of the evolution of biology from antiquity through the 18th century; the second semester will review the principal theories and developments of the 19th and 20th centuries. A special feature of the course will be the opportunity to examine the great classics of biology available in Washington.

**559. Medical and Veterinary Entomology**

Year, 2 credits each semester

F. C. BISHOPP

A timely general course in medical entomology with emphasis on the practical aspects of this important field. The biology, habits, and relation to disease of insects, spiders, mites, and ticks, are discussed. How these arthropods affect man and animals as intermediate hosts, or carriers of disease-producing organisms, is given attention and special consideration is given methods of control. The adaptation of known control procedures to present-day defense problems is considered. Features of the course include lectures by outstanding specialists in this general field and round-table discussions of practical problems.

Prerequisite: Basic training in biology or consent of instructor.

**575. Development of Genetics**

Year, 2 credits each semester

TAGE U. H. ELLINGER

A general course based principally on a study of outstanding contributions that have marked great advances in the theory and application of genetics. The first semester will deal with the work of the great naturalists from Aristotle to Charles Darwin and Sir Francis Galton, and with the fundamental biological concepts, such as the cell theory, the nature of fertilization and of the differentiation of the embryo, also with the efforts of the early plant hybridizers culminating with Mendel's discoveries. In the second semester a presentation will be given of modern genetics, including the mechanism of the transmission of hereditary characteristics (cytogenetics), physiological genetics and phases of experimental embryology, population genetics, including the evolutionary aspects, eugenics and human genetics, the breeding of animals and plants. Lectures and discussion.

**784. Genetics Seminar**

Year, 2 credits each semester

TAGE U. H. ELLINGER

In 1945-46, the main project will be a study of recent books on cytogenetics. In the selection of the material to be reviewed, consideration will also be given to the special interests and professional requirements of the individual students, even in other fields.

This and the preceding course (575) will be so conducted that students may profit by attending both.

**[554.] Advanced Plant Ecology****[555.] Plant Physiology**

GLENN A. GREATHOUSE

**[556.] Plant Biophysics**

GLENN A. GREATHOUSE

**Introduction to Experimental Design***(See Mathematics and Statistics 126)*

A. E. BRANDT

**Soil Fertility***(See Physical Sciences 157)*

J. K. ABLEITER

**Comparative World Agriculture***(See Social Sciences 581)*

CLAYTON E. WHIPPLE

# Department of Engineering and Mechanical Arts

## DEPARTMENTAL COMMITTEE

FRANCIS J. SETTE, M.S., Director, Transportation and Storage, War Production Board (Chairman)  
R. G. HAINSWORTH, M.A., Principal Economic Geographer, Office of Foreign Agricultural Relations  
ROBERT W. TRULLINGER, B.S., Assistant Chief, Office of Experiment Stations  
FAYETTE S. WARNER, Ph.D., Engineer-Economist, Federal Power Commission  
MARSHALL S. WRIGHT, Principal Cartographic Engineer, Office of the Secretary, USDA

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*Course Numbers and Symbols*—Below 100, non-credit; 100-499, undergraduate; 500-699, graduate and advanced undergraduate; above 699, graduate. Bracketed numbers, not given this year.

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## PHOTOGRAPHY

### 192. Basic Photography

Fall, 2 credits

CARL H. HANSON and SPECIALISTS

This is a lecture-demonstration course, elementary and basic in character, designed to meet the needs of the amateur. Nearly all lectures are fully illustrated with slides, supplemented by other illustrative material. Demonstrations are given when feasible. No laboratory work, but individual guidance will be freely given students who can and will arrange to do practice work. Results of practice work may be submitted for criticism.

Topics covered: elementary photographic optics, films, and plates, the use of cameras and lenses, exposure, composition, darkroom conveniences and technique, developers and development, the technique of negative making, the theory and practice of making contact and projection prints, outdoor and indoor photography, child photography, filters and their use, lighting and posing in portraiture, home portraiture, Kodachrome photography.

A list of the textbooks used in this course may be obtained from the Graduate School Office.

### 193. Applied Photography

Fall, 2 credits. Repeated in Spring

ELBRIDGE C. PURDY

This is a laboratory course which enables the students who have taken Basic Photography (Course 192 above) or equivalent to *apply* theory and principles in the studio and laboratory. Individual guidance will be given students. The results of the work will be analyzed. Topics covered: films and plates, use of cameras and lenses, exposure, composition, darkroom techniques, developers and development, theory and practice of making contact and projection prints, outdoor and indoor photography, filters and their use, lighting and posing in portraiture, and color photography.

Prerequisite: Basic Photography or equivalent.

## ENGINEERING

**175. Naval Architecture<sup>1</sup>**

Year, 2 credits each semester

CHARLES L. WRIGHT

First semester: Determination of principal dimensions of a ship; development of ship lines; displacement and stability calculations; launching.

Second semester: Trochoidal wave theory; action of ships in waves; hull form and resistance; power; propulsion; steering.

**176. Ship Construction<sup>1</sup>**

Year, 2 credits each semester

CHARLES L. WRIGHT

First semester: Shipyard organization; calculations of weight and strength of ships; riveted and welded construction; design of structural parts.

Second semester: Arrangement of machinery and fittings; piping, wiring, and ventilation; load line regulations, tonnage measurement, trial trips, dry docks.

**177. Aerodynamics**

Year, 2 credits each semester

W. E. KONECZNY

First semester: Fluid flow, wing theory, airfoil characteristics, wind-tunnel tests, stability, drag data. Lectures, discussions, and problems.

Second semester: Engine and propeller considerations, performance calculations, special problems.

Prerequisite: Physics and an elementary knowledge of algebra and trigonometry.

**Water Power Engineering**

(See Utility Administration 678)

**Electric Utility Engineering**

(See Utility Administration 857)

**Principles of Physical Metallurgy**

(See Physical Sciences 152)

**Advanced Physical Metallurgy**

(See Physical Sciences 526)

## GRAPHIC PRESENTATION

**180. Basic Mechanical Drawing**

Fall, 2 credits. Repeated in Spring

GEORGE L. EDICK

Problems in conventional presentation of objects by means of lines, including geometrical problems, orthographic projection, intersections, developments, dimensioning and lettering.

**181. Architectural Drafting**

Fall, 2 credits. Repeated in Spring

GEORGE L. EDICK

Study of framing methods and use of building materials, architectural symbols. Drawing of necessary construction details, plan. Section and elevations for a series of buildings, from sketches.

Prerequisite: Basic Mechanical Drawing or equivalent.

<sup>1</sup> It is recommended that 175 and 176 be taken together.

**182. Mechanical Drafting**

Fall, 2 credits. Repeated in Spring

GEORGE L. EDICK

Study of conventional symbols and machine shop practice. A series of problems including detail and assembly drawings. Scale detail drawings from measured sketches by the student.

Prerequisite: Basic mechanical drawing or equivalent.

**183. Surveying**

Year, 4 credits each semester

E. J. SCHLATTER

Lectures and recitation, 2 hours a week; computation and drafting room period, 2 hours a week.

First semester: General introductory study of the principles of plane surveying, including use of the tape, compass, transit, level, plane-table, etc., together with principles of instrument adjustment. The course also covers instruction in field and office procedures, class demonstration of surveying instruments, lettering practice and computations.

Second semester: Advanced classroom study of the methods of surveying applicable to topographic surveys, control for aerial photography, highway location, elementary geodetic surveys including triangulation, and cadastral surveys. The course also includes instruction in plotting from field notes and in the construction of polyconic and Lambert map projections.

The subject matter covered in both semesters is comparable to classroom courses in surveying usually required for civil engineers by accredited colleges or universities.

Prerequisite: Trigonometry.

**184. Aerial Photogrammetry**

Spring, 4 credits

REYNOLD E. ASK

Geometrical characteristics of aerial photographs, determination of tilt, photogrammetric optics, aerial cameras, flight planning, photographic materials, radial line methods and mosaics. Theory of stereoscopic plotting instruments, mapping from oblique photographs.

Prerequisite: First semester surveying and trigonometry.

**185. Pencil Sketching and Freehand Drawing**

Fall, 2 credits. Repeated in Spring

WALTER G. CADMUS

A study of shade, shadows, and perspective. An intensive study of theory, harmony of lines, and pictorial and outdoor sketching. Each student receives individual criticism. Open to both beginners and advanced students. Sketching only, two hours a week; one credit.

**194. Art Appreciation**

Fall, 2 credits

LAURA G. DOUGLAS

Behind the scenes with the artist: This course is designed to create an awareness of art, help form intelligent judgment of one's own and to create fresh interest in creative work and better taste in art.

Visual training will be developed by analyzing works of the old masters and the moderns, from case drawing to present—idioms. Demonstrating the fundamentals of plastic and architectural composition—textures, mediums, dynamic color and design. Art in relation to time and place. A course for artist and layman.

**195. Drawing for Portraiture and Illustration**

Fall, 2 credits. Repeated in Spring

PIETRO LAZZARI

Portrait drawing: planning of portraits as to composition, material and medium. Various techniques and effects in portraiture.

Basic techniques of illustration for reproduction in books, magazines and periodicals.

Fundamentals of color and approaches to painting—grounds and pigments, water-color, tempera, oil, fresco.

### 186. Interior Decoration

Year, 1 credit each semester

HARRIET GARRELS

The first semester's work includes principles of arrangement, color, walls, window treatments, floor coverings and lighting.

The second semester's work includes furniture styles, pictures, accessories, modern furniture and furnishings, and flower arrangement.

As the second semester is not based on the first, the order in which they are studied is not important. Students may register for the second semester without having covered the first. Both semesters' work will be offered each semester.

### Graphic Methods for Presenting Statistical and Geographic Data

(See Mathematics and Statistics 124)

### MECHANICAL ARTS

#### 188. Glass Blowing

Year, 2 credits each semester

L. B. CLARK

A laboratory course for technicians. Simple manipulation of joining, bending, and shaping is carried through to the production of useful apparatus. Metal in glass and glass to metal seals of all types are made. During the first semester the soft glasses are utilized for practice; during the second semester the related glasses are used. Ample opportunity for advanced work is given those who show themselves particularly adapted to the work. (New students may be admitted in the Spring if space permits.)

### TEXTILES

#### 189. Introduction to Textile Technology

Fall, 3 credits

STANLEY A. SOKOLOFF

A practical course in the fundamentals of textiles, from fiber to fabric. Intended to be particularly useful to procurement officers, engineers, and others with occupational interest in the subject, as well as informative to those seeking only a systematic understanding of our textile surroundings. Topics covered are: characteristics and identification of fibers; yarns and spinning; weave design and the loom; dyestuffs and their application; finishing processes; construction and nomenclature of typical fabrics; testing; government specifications and trade standards. Emphasis is placed on cotton, wool, and rayon, although other fibers (including the latest synthetics) are covered. Students will work with samples of various materials discussed.

#### 190. Textile Design and Fabric Development

Spring, 2 credits

STANLEY A. SOKOLOFF

The technical planning of woven fabrics. Intended to be particularly useful to persons engaged in the development of textiles for military or civilian purposes, and writers of specifications for the Government procurement agencies. Subjects covered include: basic weaves and derivatives thereof; leno and pile structures; Jacquard design; relation of weave to physical properties of fabrics; mill specifications and drafts; types of looms and their capacities; cloth analysis; cost calculations; manufacturing operations. Fabrics of varied types, from heavy

duck to brocade, are discussed. Students analyze samples and draft original designs for new fabrics, giving the technical particulars required for manufacturing.

Prerequisite: Introduction to Textile Technology, or adequate technical background in textiles.

## UTILITY ADMINISTRATION AND REGULATION

Note: These courses are offered to meet the special needs of a large group of Federal employees. For their convenience the classes will be held in buildings of the Federal Power Commission, 18th and Pennsylvania Ave., N.W.

Information about the technical content of the courses may be obtained from Dr. Fayette S. Warner. Call Branch 222, Federal Power Commission.

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### 679. Electric and Gas Utility Rates

Fall, 2 credits

H. W. BLALOCK

Principles and practice of rate design; customer and service classifications; engineering and economic factors in rates and rate contract forms and provisions; discussion of allocation of costs; problems in determination of rate discrimination; review of problems of rate base, operating expenses, depreciation and rate of return.

### 857. Electric Utility Engineering

Year, 2 credits each semester

J. J. A. JESSEL and W. J. LYNOTT, JR.

The fundamentals of electric utility engineering and their practical application to generating, transmitting, and distributing electric energy by electric utilities. Designed for engineers, engineering aids, lawyers, accountants and others who desire a broader understanding of the basic principles of electric utility engineering as applied to operating electric utilities. Subjects covered are: A general description of production, transmission, and distribution plants of electric utility, including each of the units of the property and an explanation of its functions; lectures and case studies in design and operation of electric generating stations, transmission lines and substations, and distribution substations, feeders, transformers, and services; discussions of practices followed by electric utilities in serving different classes of customers.

### 678. Water Power Engineering

Year, 3 credits each semester

KENNETH W. ROSS

A series of classroom exercises involving recitations, problem work, and lectures on the fundamentals of water power engineering and the important procedures necessary for their practical application. The subjects covered include precipitation, water losses, run off, stream flow, effects of storage, water power estimates, hydraulic turbines, and power plant arrangement. Application of fundamentals to development of river basins, and the characteristics governing the selection of dam and reservoir sites for various purposes.

Prerequisite for credit: Hydraulics.

#### [366.] Original Cost Accounting for Electric and Gas Utilities

#### [677.] Public Power

#### [680.] Public Utility Evidence

#### [581.] Manufacturing Industries and Their Use of Energy

# Department of Languages and Literature

## DEPARTMENTAL COMMITTEE

HARRY B. HUMPHREY, Ph.D., Principal Pathologist (retired), Bureau of Plant Industry, Soils, and Agricultural Engineering (Chairman)  
GOVE HAMBIDGE, A.B., Coordinator of Research Publication, Agricultural Research Administration  
M. C. MERRILL, Ph.D., Chief of Publications, Office of Information  
MARJORIE C. JOHNSTON, Ph.D., Specialist in Spanish, U. S. Office of Education  
RALPH R. SHAW, M.S., Department Librarian (on military leave)

## IMPORTANCE OF ENGLISH WRITING AND SPEECH

Among students preparing for technical careers and among busy people employed on the basis of their technical competence, there is an inevitable tendency to concentrate on subject-matter specialties, to the great neglect—if not exclusion—of the auxiliary subjects that can effectively implement such specialties. It is common knowledge in the Government service that nothing so much retards the progress of many young technicians, scientists, and other professional personnel as their inability to incorporate the results of their thinking and of their research in effective, concise, lucid English, written or oral. Technical knowledge is of no value unless it can be communicated to others. There are indeed few persons who cannot greatly benefit from the further sharpening of their tools of communication.

In selecting for the Department of Languages and Literature the courses in English here described, much thought and care have been given those branches of our language that are basic and necessary to its intelligent use and finesse in expression. The major objective is the development of facility of expression, both oral and written, so that thoughts and feelings can be presented clearly, interestingly, and convincingly.

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*Course Numbers and Symbols*—Below 100, non-credit; 100–499, undergraduate; 500–699, graduate and advanced undergraduate; above 699, graduate. Bracketed numbers, not given this year.

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## ENGLISH

### 222<sup>a</sup>. Composition and Rhetoric

Fall, 3 credits. Repeated in Spring

SUSAN E. HARMAN  
FRANCES H. MILLER

Equivalent of freshman English. An introductory course in writing and English usage, designed especially for those who need a course preparatory to more advanced English studies. Special attention given to the fundamental

principles and mechanics of good writing—grammar, punctuation, spelling, dictation, etc. Exercises in writing short and long themes and in studying, analyzing, and evaluating selected English prose texts. (Students who have completed four credits under the former arrangement of the course may obtain the additional credit requirement in the spring semester.)

### **222<sup>b</sup>. Composition and Rhetoric**

Spring, 3 credits

Continuation of course 222<sup>a</sup> above.

ROMAIN G. GREENE

### **223. Descriptive English Grammar**

Fall, 2 credits. Repeated in Spring

SUSAN E. HARMAN

KATHRYN WARD

A course in grammatical principles, stressing sentence structure and correct English form. Exercises in diagramming and analyzing sentences and in correcting examples of English.

## WRITING AND EDITING

### **224. Creative Writing**

Fall, 2 credits. Repeated in Spring

DELIGHT HOLT

Primarily this course aims to develop the student's inclination to practice writing through guidance and example. Emphasis is laid on facility of expression. The course presupposes fundamental knowledge of composition. Stories, sketches, articles, book and magazine reviews, personal letters, and letters to editors are assigned work.

### **225. Editing**

Fall, 3 credits

M. C. MERRILL and SPECIALISTS

Limited to 40 students.

Intended primarily for those seeking information on editorial techniques involved in handling manuscripts after they leave the author's hands and until they are issued in printed form. Discussion of the fundamental principles of editing, including the organization or rearrangement of material for effective presentation; rhetorical style in relation to subject matter; sentence structure and effective use of English; paragraphing and leads; consideration governing titles, tables of contents, headings, footnotes, illustrations, literature citations and bibliographies, and statistical checking; the principles of table formation and arrangement; typography and the relation of type to subject matter; and the fundamentals of indexing and proofreading. Practical examples of editorial work are discussed in class. Opportunity for some familiarity with the style manual of the Government Printing Office is provided. Collateral reading is indicated. Those desiring credit for the course are required to pass a written examination at the end of the semester.

### **237. Government Printing Procedure**

Fall, 1 credit. Repeated in Spring

LOUIS H. FRANKEWICH

Intended for those whose task it is to make arrangements for the printing of books, pamphlets, posters, folders, charts, forms, and other printed matter, and who deal with author or editor and the printer. Subjects covered include: analysis of the manuscript and its purpose to determine the format of the printed piece; copy fitting and measuring; organization of copy; economy of attention of the reader; legibility and readability; type faces and typography; illustrations; printing processes; paper; binding; preparation of copy for the printer, handling of proofs; specifications and cost factors. The knowledge of methods and procedures to be acquired from this course is intended to give the students competence and confidence in dealing with author, editor, and printer.

**226<sup>a</sup>. Writing for Official Purposes**

Fall, 2 credits

HOWARD ZAHNISER

How to present facts and ideas in official writing is the problem of this course. Every type of writing has its own requirements. Official writing, though like other writing in most respects, has important peculiarities. For example, it must respect the boundaries of science, of governmental organization, and of official policy. Frequently the attempt to do so makes it wordy, wooden, and lifeless. The course, which presupposes some writing experience, considers ways of making government writings clear, vigorous, and readable in spite of the necessary rules and restrictions. It shows where the limitations do not apply, as well as where they do, so that all possible freedom may be developed. One major writing project is required to earn credit for the course.

**226<sup>b</sup>. Writing for Official Purposes**

Spring, 2 credits

FRANK THONE

This course will present informally the elements of popular writing on scientific and technical subjects, with special attention to the requirements of newspapers and general magazines. The seminar method will be followed as far as practicable, and as much practice in actual preparation of copy as possible will be given.

Prerequisite: Course 226<sup>a</sup> or consent of instructor.

**[565.] Writing of Documented Papers**

HARRY B. HUMPHREY

**SPEECH****228. Fundamentals of Speech**

Fall, 2 credits

HESTER B. PROVENSEN

A course to develop in the speaker the ability to communicate his ideas readily and effectively through the study of audience analysis, distinct utterance, outlining, word usage, enrichment of vocabulary, and voice production. Ample opportunity to speak. Individual criticism.

**229. Effective Speaking**

Spring, 2 credits

HESTER B. PROVENSEN

Clear, forceful, and convincing expression is the result of directed practice in a variety of speech situations. This course concentrates on preparation and practice in public speaking and the speech arts. Speeches for special occasions, description, exposition, radio speaking, story telling, and training in the art of conversation. Emphasis is on practice; knowledge of speech fundamentals is presupposed. Enrollment limited to 25.

**232. Voice and Remedial Speech**

Fall, 2 credits. Repeated in Spring

WALTER B. EMERY

Study and intensive drills in voice production, flexibility, range, articulation, and enunciation. Training and practice are designed to improve vocal conditions for all speech purposes and to remedy minor speech difficulties. In order that students may receive more individual attention, registration is limited to twenty.

**566. Advanced Diction for Executives**

Fall, 2 credits

GEORGE E. BEAUCHAMP

A practical study of word choice and discrimination, based upon the new research in vocabulary and its relation to effective thinking, speaking, and writing. Keyed to executives who wish to increase their verbal ability; enrollment is limited to those whose Civil Service rating is CAF-7, P-2, or higher.

**326. Parliamentary Procedure**

Fall, 2 credits. Repeated in Spring

GEORGE E. BEAUCHAMP

Practice and practical instruction in how to uphold your views and your rights in meetings; motions and methods available to accomplish desired results; how to prevent undesirable or undemocratic action; and how to serve efficiently as a chairman, secretary, or other officer of a meeting or group.

**43. Personal Development**

Fall, non-credit. Repeated in Spring

HESTER B. PROVENSEN

Discovery and development of the potentialities of each student. Poise, confidence, appearance, make-up, dress and color sense, art of conversation, and cultivation of wider range of interest and curiosity. Actual social situations created and discussed. Conferences, guest speakers.

**LITERATURE****327. Current Books**

Fall, 1 credit. Repeated in Spring

MARY-CARTER ROBERTS

This course will be divided between fiction and non-fiction. In both groups treatment will be given (a) books which have lasting literary merit, (b) books which deal with significant current questions, and (c) books which have attained striking popularity. The periods will be divided between the lecture by the instructor and a discussion by the students. The aim of the course is to encourage a conscious attitude of discrimination toward current writing.

**IMPORTANCE OF FOREIGN LANGUAGES**

In his *Education* Henry Adams says of his experience:

"Had Adams in 1894 been starting in life as he did in 1854, he must have repeated that all he asked of education was the facile use of the four old tools: Mathematics, French, German, and Spanish. With these he could still make his way to any object within his vision, and would have a decisive advantage over nine rivals in ten. Statesman or lawyer, chemist or electrician, priest or professor, native or foreign, he would fear none."

If he were writing today Adams might be willing to add other languages to the list or to permit their substitution for those mentioned. In any case, what he says forcefully indicates the tremendous importance of foreign-language study.

By its spectacular military events and its unprecedented expansion of all kinds of international activities, the war has greatly increased interest in nearly all foreign languages. Research workers, propaganda analysts, persons engaged in all aspects of international relations, and persons scheduled for overseas assignments are in vital need of foreign-language instruction—instruction in many languages little taught before the war, in facility of speech and ease of writing, and in beginning courses, advanced courses, and review courses. All these opportunities are made available through the Graduate School.

It is the aim of those responsible for these courses to conduct them so as to develop in their students a ready and intelligent use of the language. The person who is seeking the maximum practical value from a foreign language must learn not only to translate it but to think in it well enough for translation to be unnecessary. He should acquire a spoken command of at least one language other than his own. No one should be content with a smattering of a language. He should attempt to perfect his skill in it until the language becomes a useful auxiliary means of communication.

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Unless otherwise specified, all foreign language courses are organized as follows:

*Elementary year*—foundation work in grammar, vocabulary, reading, and translation, with some conversation.

*Intermediate year*—grammar review, more difficult reading and translation, use of idioms, writing and discussion in the language.

*Conversation*—development of facility in discussion and reading, use of idioms, writing and thinking in the language without translating.

*Note: Course numbers followed by (a) are first-half of that course, or by (b) are second-half.*

#### DIRECTED LANGUAGE STUDY

In some languages enrollment is insufficient after the first year to justify offering instruction on a regular basis. If fifteen or more students inform the Graduate School Office of their wish to take advanced work in a language, a class may be organized in which students will proceed with their study on an individual basis under the instruction of a teacher who will guide their study.

#### ARABIC

##### **233<sup>a</sup>. Elementary Arabic**

Fall, 2 credits

AFIF TANNOUS

##### **233<sup>b</sup>. Elementary Arabic**

Spring, 2 credits

AFIF TANNOUS

#### CHINESE

##### **238<sup>a</sup>. Elementary Chinese**

Fall, 4 credits

I-MIEN TSIANG

An introductory course in the fundamentals of the Chinese language (Mandarin): elements of grammar, reading and writing of Chinese characters, and simple conversation.

##### **238<sup>b</sup>. Elementary Chinese**

Spring, 4 credits

I-MIEN TSIANG

## FRENCH

**253<sup>a</sup>. Elementary French**

Fall, 3 credits

HARRY B. HUMPHREY

**253<sup>b</sup>. Elementary French**

Spring, 3 credits

HARRY B. HUMPHREY

**254<sup>a</sup>. Intermediate French**

Fall, 3 credits

HARRY B. HUMPHREY

**254<sup>b</sup>. Intermediate French**

Spring, 3 credits

HARRY B. HUMPHREY

**255<sup>a</sup>. Conversational French**

Fall, 3 credits

PAUL L. GRIGAUT

**255<sup>b</sup>. Conversational French**

Spring, 3 credits

PAUL L. GRIGAUT

## GERMAN

**259<sup>a</sup>. Elementary German**

Fall, 3 credits

JOSEPH PONTI

**259<sup>b</sup>. Elementary German**

Spring, 3 credits

JOSEPH PONTI

**260<sup>a</sup>. Intermediate German**

Fall, 3 credits

MAX LEDERER

**260<sup>b</sup>. Intermediate German**

Spring, 3 credits

MAX LEDERER

**261<sup>a</sup>. Conversational German**

Fall, 3 credits

MAGNA E. BAUER

## ITALIAN

**270<sup>a</sup>. Elementary Italian**

Fall, 3 credits

JOHN ROSSETTI

**270<sup>b</sup>. Elementary Italian**

Spring, 3 credits

JOHN ROSSETTI

## JAPANESE

**275<sup>a</sup>. Elementary Japanese**

Fall, 3 credits

JOSEPH G. YOSHIOKA

**275<sup>b</sup>. Elementary Japanese**

Spring, 3 credits

JOSEPH G. YOSHIOKA

## PORTUGUESE

**290<sup>a</sup>. Elementary Portuguese**

Fall, 3 credits

RAUL D'ECA

**290<sup>b</sup>. Elementary Portuguese**

Spring, 3 credits

RAUL D'ECA

## RUSSIAN

**295<sup>a</sup>. Elementary Russian**

Fall, 3 credits. Repeated in Spring

GEORGE M. SAHAROV

EUGENIA TARAKUS

NATHALIE VON BRETZEL

ERIC T. SCHULER

**295<sup>b</sup>. Elementary Russian**

Fall, 3 credits. Repeated in Spring

GEORGE M. SAHAROV

NATHALIE VON BRETZEL

**296<sup>a</sup>. Intermediate Russian**

Fall, 3 credits

NATHALIE VON BRETZEL

**296<sup>b</sup>. Intermediate Russian**

Spring, 3 credits

NATHALIE VON BRETZEL

**297<sup>a</sup>. Conversational Russian**

Fall, 2 credits

GEORGE M. SAHAROV

Prerequisite: Two years of Russian.

**297<sup>b</sup>. Conversational Russian**

Spring, 2 credits

GEORGE M. SAHAROV

**[299.] Advanced Russian**

GEORGE M. SAHAROV

## SPANISH

**300<sup>a</sup>. Elementary Spanish**

Fall, 3 credits. Repeated in Spring

MANUEL I. ABELLA

CONSUELO BATISTA

MARCUS GORDON BROWN

MARJORIE C. JOHNSTON

RUBERTA M. OLDS

ARTHUR C. PARSONS

MADALINE W. NICHOLS

MARGARET WOODS

**300<sup>b</sup>. Elementary Spanish**

Fall, 3 credits. Repeated in Spring

MANUEL I. ABELLA

CONSUELO BATISTA

MARJORIE C. JOHNSTON

RUBERTA M. OLDS

**301<sup>a</sup>. Intermediate Spanish**

Fall, 3 credits. Repeated in Spring

MICHAEL LEVER

MARCUS GORDON BROWN

**301<sup>b</sup>. Intermediate Spanish**

Spring, 3 credits

MARCUS GORDON BROWN

**302<sup>a</sup>. Spanish Conversation and Literature**

Fall, 2 credits

ENRIQUE A. GIRO

**302<sup>b</sup>. Spanish Conversation and Literature**

Spring, 2 credits

ENRIQUE A. GIRO

**304. Commercial Spanish**

Fall, 3 credits

MICHAEL LEVER

Advanced composition in commercial correspondence; commercial geography, monetary systems, certificates and invoices, etc.; cable systems, insurance and banking abbreviations. Designed to give the intermediate student of Spanish familiarity with current commercial correspondence usage and ability to compose acceptable commercial correspondence.

Prerequisite: One year of elementary Spanish or equivalent.

**La America Latina y Los Estados Unidos***(See Social Sciences 611)*

# Department of Mathematics and Statistics

## DEPARTMENTAL COMMITTEE

W. EDWARDS DEMING, Ph.D., Adviser in Sampling, Bureau of the Budget (Chairman)  
PHILIP M. HAUSER, Ph.D., Assistant Director of the Census  
M. A. GIRSHICK, M.A., Principal Agricultural Statistician, Bureau of Agricultural Economics  
B. R. STAUBER, M.A., Chief, Relocation Planning Division, War Relocation Authority  
O. C. STINE, Ph.D., Head, Division of Statistical and Historical Research, Bureau of Agricultural Economics

## OPPORTUNITIES FOR STUDY AND WORK

To a greater extent than ever before, our country is dependent on the analysis of quantitative data. Action in the solution of problems in industrial and agricultural production requires prediction, which in turn requires skill in the collection, evaluation, and analysis of data, plus knowledge of the subject matter gained through studies of economics, sociology, engineering, or other branches of the natural and social sciences. In industry and in Government service, the demand for valid methods of prediction as a basis for action is placing more and more stringent requirements on statistical methods, as more and more is expected of public programs designed to stabilize or improve economic and social conditions.

Indications point to good employment opportunities in statistical work during the next decade. In particular, the demand for highly trained specialists in statistical research and application in numerous fields is expected to exceed the supply several fold. The situation in Washington creates an unusual opportunity for students who wish to pursue studies in statistics. For years, Washington has more and more been becoming the center of many activities, political, economic, and scientific. Government statisticians, by the nature of their duties, must make predictions, recommend action, and face the consequences. They are daily faced with exacting realities and responsibilities; they are daily putting their statistical methods to test, and through research are developing new statistical methods to meet new and more exacting requirements. Some of the leading statisticians of Washington are giving courses in the Graduate School.

## CERTIFIED STATEMENTS OF ACCOMPLISHMENT

A Certified Statement of Accomplishment is offered in each of four fields of statistical study—fields representing areas of statistical

preparation and application most useful in the public service. The required program in each field is outlined below. The student who completes the basic courses and earns 24 credits in specialized courses listed in any column, with substitutions only as specifically approved, is eligible to receive a Certified Statement of Accomplishment bearing the official seal of the School and signed by the Director and the Chairman of the Department of Mathematics and Statistics. The Statement is not a diploma nor simply a transcript of credit, but it combines certain useful features of both. It is a certification that the student has completed a program of study which, in conjunction with collateral training in a subject-matter field of application, prepares him for effective public service in a particular statistical field. Courses completed and the quality of accomplishment will be recorded on the back of the Statement, which may be used as a personal record of achievement or a public record of qualification.

#### SUGGESTIONS FOR PROGRAMS OF STUDY

The statistical method is the science of discovering assignable causes of variability in measureable phenomena, and of measuring the effect of these causes with the view of making predictions and thus to assist in the rational formulation of courses of action. Statistical work consists of planning and carrying out the collection, classification, analysis, interpretation, and presentation of quantitative data, and of developing methods for improving the precision and reliability of methods for doing this work at the lowest possible cost. The trained statistician is particularly equipped by training and experience to assist in the formulation of scientific courses of action in government, manufacturing, and distribution. He must know when data are needed and how much precision is required. The courses offered on the following pages accordingly provide training not only in theoretical principles, but training also in the administrative and research uses of data, as well as in the collection and processing of data and in the development and supervision of the minor skills necessary for carrying out statistical work.

A fundamental requirement of a good statistician is that he know the subject matter of the field that he is working in. Completion of a particular curriculum of study in statistics will not of itself produce a statistician. The student of statistics, aspiring to obtain a Certified Statement of Accomplishment, is expected to attain competence also in some subject-field such as economics, sociology, biology, agriculture, or engineering. The School will issue a Certified Statement of Accomplishment in statistics only after the Departmental Committee is satisfied that the student has attained

## COURSES LEADING TO CERTIFIED STATEMENTS OF ACCOMPLISHMENT IN STATISTICS

With Concentration in One of the Following Fields of Application

PROCESSING OF DATA	SOCIAL SCIENCES	BIOLOGICAL AND PHYSICAL SCIENCES	DESIGN AND INTERPRETATION OF SAMPLING SURVEYS
<b>BASIC COURSES—Required of all candidates</b>			
102. Algebra 127 or 143. Introduction to Statistical Analysis	102. Algebra 103. Trigonometry and Analytic Geometry 127 or 143. Introduction to Statistical Analysis	102. Algebra 103. Trigonometry and Analytic Geometry 127 or 143. Introduction to Statistical Analysis	102. Algebra 103. Trigonometry and Analytic Geometry 106. Calculus 127 or 143. Introduction to Statistical Analysis 723. Design and Analysis of Complex Experiments
<b>SPECIALIZED COURSES—24 credits, selected from appropriate field of application, required of all candidates</b>			
518. Machine Tabulation 519. Advanced Study of Tabulating Equipment or	106. Calculus 517. Tabulation Procedures 520. Statistics of the Federal Government	106. Calculus 702. Theory and Practice of Sampling 704. Interpolation, Approximation, and Mechanical Quadrature 726. Interpretation of Statistical Calculations 727. Planning of Statistical Surveys 729. Population Statistics 732. Sampling in Social and Economic Surveys 729. Population Statistics 736. Techniques of Interviewing 743. Research Methods in Population and Labor-Force Inquiries	500. Advanced Calculus 702. Theory and Practice of Sampling 708. Linear Algebra 712. Theory of Functions 723. Design and Analysis of Complex Experiments 735. Theory of Sample Surveys 739. Multivariate Analysis 740. Analysis of Variance 741. Theory and Application of the Characteristic Function 742. Modern Theories of Probability 748. Selected Topics in Statistical Research 749. Control of Quality
<b>ELECTIVE COURSES</b>			
			741. Theory and Application of the Characteristic Function 743. Research Methods in Population and Labor-Force Inquiries 744. Modern Theories of Probability 745. Modern Analysis of Time Series
			500. Advanced Calculus 502. Differential Equations 704. Interpolation, Approximation, and Mechanical Quadrature 712. Theory of Functions 709. Theory of Infinite Processes

such competence in addition to the completion of an approved curriculum of study in statistics.

People who do not intend to become professional statisticians but simply desire to learn the elements of statistics as a tool, or people who desire to train for clerical-statistical positions, should, of course, ignore the requirements for a Certified Statement and concentrate on basic statistical courses suited to their special needs.

The requirements set for statisticians by the United States Civil Service Commission vary with the level of position and the field of work involved. It should be noted that academic training in statistics is not of itself qualifying; where academic background in statistics is necessary there are other additional requirements such as general education, professional specialization, and experience.

It is suggested that those interested in taking courses related directly to their present assignment, and those uncertain as to which courses parallel the level of their training and backgrounds, consult with their supervisors. Attention is called again, in this connection, to the counseling services described on page 11.

#### SEMINARS IN SAMPLING

Seminars in sampling and statistical inference are held approximately six times a year under the direction of Dr. W. Edwards Deming. These meetings are held primarily for advanced students in the Graduate School, but are addressed and attended by the leading mathematical statisticians in the city. No fee is charged; registration, however, is required. Applications for new admissions to the seminar should be sent in writing to the Director, with a statement regarding the applicant's qualifications for attendance. Notices regarding meetings are sent to those whose names are on the list. The following meetings were held during the past academic year:

December 14. Mr. Richard H. Blythe (Forest Service). Chairman: Major James G. Osborne. Optimum size of sample in measuring logs for sale.

November 20. Dr. Horace W. Norton (Weather Bureau). Chairman: Mr. George Dantzig. A method for calculating chi-square in complex contingency tables.

February 23. Dr. Margaret J. Hagood (BAE). Chairman: Dr. Francis McIntyre (FEA). Development of a general-purpose sample of 101 counties for surveys of farms and farm people.

March 30. Mr. Earl E. Houseman (BAE). Chairman: Dr. Donald E. Church (OPA). Choice of a sampling unit.

April 20. Dr. W. G. Madow (Census). Chairman: Dr. Jacob L. Mosak (OPA). Summary of recent developments in the analysis of time series.

April 27. Messrs. Morris H. Hansen and William N. Hurwitz (Census). Chairman: Mr. Edward B. Hincks (BB and SWPC). Sampling plans for a national sample of business.

May 4. Professor Harold Hotelling (Columbia University). Chairman: Lt. John H. Curtiss. New statistical problems in experimental design.

May 18. Dr. Thomas N. E. Greville (Census). Chairman: Mr. Jerome Cornfield (BLS). Summary of recent articles in the theory of matching.

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*Course Numbers and Symbols*—Below 100, non-credit; 100–499, undergraduate; 500–699, graduate and advanced undergraduate; above 699, graduate. Bracketed numbers, not given this year.

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## MATHEMATICS

### 1. Review of Freshman Mathematics

Fall, non-credit

EMIL SCHELL

A review course on the level of freshman mathematics. Algebra, trigonometry, analytic geometry. A brief introduction to the methods of the differential calculus. Emphasis on applications to statistical problems.

### 102. Algebra

Fall, 2 credits

C. H. GRAVES

Fundamental rules of algebra; exponents; logarithms; manipulations with proportions; identities and conditions; solution of equations; binomial theorem; numerical approximations. Uses of symbolic operators. Determinants; solution of equations by the reciprocal matrix. Theory of equations; progression; series. Permutations and combinations. Graphical methods. Emphasis on applications to statistics and the physical sciences.

Prerequisites: High-school algebra, and plane and solid geometry.

### 103. Trigonometry and Analytic Geometry

Spring, 2 credits

C. H. GRAVES

Definitions in trigonometry; identities; complex numbers; DeMoivre's theorem; trigonometric equations. The study of analytic geometry will include the line, conic sections, and some other plane curves, polar coordinates; families of curves with one or more parameters. Parametric equations of curves. Radical axis. Graphic solution of equations. Some three-dimensional geometry. Prerequisite: College algebra.

### 106. Calculus (1946–47; every two years)

E. J. FINAN

**107. Survey of College Mathematics**

Spring, 3 credits

EMIL SCHELL

A course covering the ideas and methods of modern mathematics, designed for students who wish to unify their mathematical training. Subjects treated consist of the theory of numbers, the number system, geometrical constructions, projective geometry, topology, functions, and limits. Emphasis will be placed upon the content and purpose of mathematical learning by appropriate illustrations from various fields. Text: Courant and Robbins, *What is Mathematics?* (Oxford, 1941).

Prerequisites: Calculus, or the consent of the instructor.

**500. Advanced Calculus**

Year, 3 credits each semester

RICHARD K. COOK

Review of fundamental theory of the calculus, Taylor's series and related subjects. Plane curves, envelopes, order of contact. Differentiation and integration of integrals; line, surface and volume integrals. Infinite and improper integrals. Some calculus of variations. Asymptotic series and approximations to definite integrals in functions with several variables. Function scales and relations between derivatives. Reduction of curves to linear relations. Surfaces, tangent planes, and normals. Some study in the complex variable.

Prerequisite: Calculus.

**501. Intermediate Algebra**

Year, 2 credits each semester

E. J. FINAN

Miscellaneous equations; proportion and manipulation; mathematical induction, multinomial theorem; inequalities; undetermined coefficients; determinants, theory of equations, matrix algebra; root-squaring processes. History. This course is advised as preparation for Linear Algebra 708. Text: Hall and Knight, *Higher Algebra* (Macmillan).

Prerequisite: Two semesters of college mathematics.

**[502.] Differential Equations (1947-48; every three years)**

RICHARD K. COOK

**704. Interpolation, Approximation, and Mechanical Quadrature**

Year, 2 credits each semester. Offered every three years

C. WINSTON

Interpolation. Forward and backward difference-formulas. Central difference formulas. Operational notation. Sheppard's zig-zag rule. Inverse interpolation. Aitken's iteration method. The throw-back. Double-entry interpolation. Osculatory interpolation. Construction of tables. Derivatives from differences; differences from derivatives. The Euler-Maclaurin sum. Some work in difference equations. Calculation of derivatives and integrals. Theorems of Weierstrass. Approximations of continuous functions by polynomials and trigonometric sums. Tchebycheff's "best" approximation. Remainder, convergence, and divergence of interpolation formulas. Quadrature; degree of approximation; convergence. Theorems of Legendre, Gauss, Bernstein, Poussin, Jackson, and Shohat.

Prerequisites: Calculus; theory of functions advised.

**[705.] Thermodynamics (1946-47; every three years)**

RICHARD K. COOK

**706. Analytical Mechanics**Year, 3 credits each semester. Offered every three years **RICHARD K. COOK**

The elements of vector analysis. The fundamental principles of statics, kinematics, and dynamics. Lagrange's and Hamilton's generalized equations. Central forces; vibrations; wave motion; gyroscope; top. Potential theory.

Prerequisites: Calculus, college physics, and elementary statics and dynamics.

**[707.] Statistical Mechanics and Kinetic Theory of Gases (1946-47; every three years)****RICHARD K. COOK****708. Linear Algebra**

Spring, 3 credits. Offered alternate years

**M. A. GIRSHICK**

Determinants. Theory of linear dependence. Linear equations, homogeneous and nonhomogeneous. Matrix algebra; calculation of the inverse matrix; application to linear equations. Linear transformations. Quadratic forms; the matrix and discriminant. Reduction of a quadratic form to a sum of squares. The characteristic equation; definite and indefinite forms. Pairs of quadratic forms, reduction to normal form. Properties of polynomials. Invariants, covariants, half-invariants, and annihilators. Canonical formation of binary cubicals and quadratics. Symmetric functions. Elementary divisors. This course is a prerequisite for Multivariate Analysis, Statistics 739.

Prerequisite: College algebra and calculus.

**[709.] Theory of Infinite Processes (1946-47; every three years)****C. WINSTON****[712.] Theory of Functions (1947-48; every three years)****C. WINSTON****STATISTICS***Beginning Courses***123. Survey of Statistics**

Fall, 3 credits. Repeated in Spring

**SAMUEL WEISS**

A one-semester non-mathematical course designed particularly to train statistical clerks in the fields of economics, sociology, and business. Algebra is reviewed as required. Operations with symbols. Summarizing data by tabulation and by statistical predictions. The Shewhart control charts. Randomness. Computations and interpretation of statistical functions. Correlation. Business indexes. Trend analysis and curve fitting. Graphic analysis. Instruction in calculations and table making. Short cuts by the use of charts, multiplication tables, logarithms, slide rule, and other devices.

**124. Graphic Methods of Presenting Statistical and Geographical Data**

Year, 2 credits each semester

**R. G. HAINSWORTH**

First semester. Application of various classes, forms, and types of illustrations. Actual working examples in time series charts, frequency diagrams, graphic correlation charts, pictorial symbol charts, and other illustrative examples. Reduction, reproduction and color application in relation to preparation of graphic charts, graphs and diagrammatic illustrations.

Second semester. Interpretation and classification of maps both statistical and geographic. Standards and tolerances as applied to maps; discussion of various methods of preparing maps both statistical and geographic. Actual working layouts of grid systems for the more important projections will be made in class; working examples will also be made of the various types of statistical maps. Color, reproduction, standardization, methods of compiling data, and other important factors relating to general mapping will be discussed.

Prerequisite: An introductory course in statistics, or experience approved by the instructor.

### 127a. Introduction to Statistical Analysis

Fall, 2 credits. Repeated in Spring

C. M. PURVES

JOSEPH STEINBERG

The collection of economic and census data; the presentation of data in tables and graphs; different kinds of averages; measures and significances of dispersion; elementary principles of sampling; introduction to index numbers and time series; preparation of formulas for machine calculations. Use of slide rule and charts for performing calculations.

Prerequisite: Algebra.

### 127b. Introduction to Statistical Analysis

Fall, 2 credits. Repeated in Spring

JOSEPH STEINBERG

C. M. PURVES

A continuation of Introduction to Statistical Analysis 127a. Problems in the relations between two or more variables. Association, correlation, and regression, leading into multiple and partial correlation. Introduction to sampling and statistical inference. Adaptation of formulas to computation by machine.

### 143. Introductory Statistical Analysis in the Natural Sciences

Fall, 2 credits. Given at the Weather Bureau

BENJAMIN J. TEPPING

This course commenced in February 1945. Following is the outline of topics for the second half of the course. Analysis of relations among several variables; curve fitting, simple and multiple correlation, other measures of relationship, time series and problems of forecasting. Applications will be submitted by members of the class for discussion.

Prerequisite: The first half of the course, or its equivalent.

### 516. Intermediate Statistics

Year, 2 credits each semester

FRANCIS P. HOEBER

After a review of elementary principles and methods, a critical study is made of various topics, the purpose being to lay a foundation for effective work in statistical practice and for advanced study. Special attention is given to sampling and the uses of sample data.

Prerequisite: Statistics 127.

### 518. Machine Tabulation

Fall, 1 credit. Repeated in Spring

MILTON KAUFMAN

Registration limited to 30. Given in Rm. 2115 at the Census Building, Suitland. Registration may be made either at the Census or Graduate School.

The punch card method. Functions of the principal machines. Instruction covers actual wiring of all types of I.B.M. tabulating equipment. Use of cards to obtain sums of squares and cross products in correlation and curve fitting is demonstrated.

**519. Advanced Study of Tabulating Equipment**

Fall, 1 credit. Repeated in Spring

MILTON KAUFMAN

Given in Rm. 2115 at the Census Building, Suitland. Registration may be made either at the Census or Graduate School.

The solution of difficult problems in the application of tabulating equipment. The instruction includes the actual operation and wiring of the principal machines involved.

Prerequisite: A course in machine tabulation.

**[520.] The Statistics of the Federal Government (1946-47; every two years)**

MORRIS B. ULLMAN

*Advanced Courses***708. Linear Algebra**

Spring, 3 credits. Offered alternate years

M. A. GIRSHICK

For the outline and special notes regarding this course, see the description under Mathematics.

**723. Design and Analysis of Complex Experiments**

Year, 2 credits each semester. Offered alternate years

O. A. POPE

A course intended to cover the design of problems in testing as met in agriculture and industry, the purpose being to discover the least expensive procedure for obtaining the information that is needed. Long-range agricultural experiments will be studied. Essentials of the Shewhart methods of control. Efficient procedures in weighing; best allocation of points for finding the maximum of a function, or its zeros (Hotelling). Variance, correlation, and regression methods of analysis.

Prerequisites: A course in intermediate statistics; statistical experience; a degree in one of the sciences; or the consent of the instructor.

**[726.] Interpretation of Statistical Calculations (1946-47; every two years)**

ALEXANDER STURGES

**727. The Planning of Statistical Surveys**

Year, 2 credits each semester. Offered alternate years

A. J. JAFFE

Administrative uses of statistical data. Special difficulties in the collection of information on employment, unemployment, payrolls, costs, prices, consumption, opinions and attitudes. Statement of purpose of a survey; definition of the universe, with attention to special difficulties. Interviewing; construction of questionnaires. Complete and partial investigations; comparisons of biases in different kinds of partial investigations. Advantages and disadvantages of sampling. Computation of costs. Tabulation plans. Presentation of results for research purposes and for administrative use.

Prerequisites: Intermediate statistics; statistical experience; academic work and practice in sociology and economics.

**[731.] Least Squares and Curve Fitting (1947-48)**

W. EDWARDS DEMING

**732. Sampling in Social and Economic Surveys**

Fall, 3 credits. Repeated in Spring LESTER R. FRANKEL and J. STEVENS STOCK

A one-semester course. Applications of the representative method to practical and timely problems. Fallacies of the total count. Accuracy and preci-

sion. Problems involved in the selection of a sample. The theory of random sampling. The choice of sampling unit. Subsampling, stratified sampling, purposive selection. The use of intra-class correlation and analysis of variance in the design of sampling techniques. Analysis of cost data. Review of important sampling procedures as used in the United States and foreign countries.

Prerequisite: Introduction to Statistical Analysis, 1st and 2d half; and experience in social surveys.

### 733. Theory of Sampling

Year, 2 credits each semester. Offered alternate years

JEROME CORNFIELD and W. D. EVANS

The planning of social and economic surveys to achieve maximum efficiency. The course is designed to provide general methods which may be applied to a large variety of sampling situations. Stratification; choice of sampling units. Sampling from finite population; double sampling; form of estimate; design of samples to minimize the error in estimating means, ratios, percentiles, distributions, regressions. Uses of biased methods of sampling and weighting. Evaluation of the precision and bias of the results obtained.

Prerequisite: Introduction to Statistical Analysis, 1st and 2d half; calculus.

### 735. Theory of Sample Surveys

Year, 2 credits each semester

WILLIAM N. HURWITZ

History of sampling in social surveys. The use of statistical control in improving the quality and efficiency of the estimates. Calculation of sampling errors. Random, stratified random, purposive, double and systematic sampling. Cost function, choice of sampling unit; size and type of sample necessary to attain a stated degree of precision, and the distinction between precision and accuracy. The theory of probability is developed as necessary. The contributions of Fisher, Neyman, Yates, Cochran, and others are studied.

Prerequisites: Introduction to Statistical Analysis, 1st and 2d half; calculus.

### [736.] Techniques of Interviewing and Questionnaire Construction (1946-47)

RENSIS LIKERT and CHARLES F. CANNEL

### [738.] Introduction to Sampling and Statistical Inference (1946-47; every two years)

W. EDWARDS DEMING

### [739.] Multivariate Analysis (1946-47; every two years)

M. A. GIRSHICK

### [740.] Analysis of Variance (Fall, 1947-48; every two years)

M. A. GIRSHICK

### 741. Theory and Application of the Characteristic Function

Year, 2 credits each semester. Offered every third year

LT. COL. SOLOMON KULLBACK

Set functions; monotone functions, Stieltjes integrals. The Fourier integral and its transform. Harmonic analysis. The characteristic function; its moment generating properties; inversion formula; property of continuity. Applications of the characteristic function.

Prerequisite: Some advanced work in statistics; advanced calculus or theory of functions.

**[743.] Research Methods in Population and Labor-Force  
Enquiries (1946-47; every two years)**

A. J. JAFFE

**744. Modern Theories of Probability**

Year, 2 credits each semester

JOSEPH L. DOOB

Basic concepts of probability, with applications to stochastic processes in sampling and special problems in physics.

Prerequisites: Advanced calculus or theory of functions; advanced theory of statistics.

**745. Seminars in Sampling and Statistical Inference**

Year, non-credit

W. EDWARDS DEMING

Notices regarding meetings are mailed to those who are registered. See the special announcement on page 33.

**[747.] Modern Analysis of Time Series (1946-47; every  
three years)**

WILLIAM G. MADOW

**749. Control of Quality by Statistical Methods**

Fall, 2 credits LAWRENCE SHAW, with special lectures by COL. LESLIE E. SIMON

Experiments in statistical variability. Chance causes and assignable causes. The Shewhart control chart. Distinctions between different kinds of charts; conditions under which each applies. Illustrations with data obtained from manufacturing. Reduced inspection. Impact of statistical methods on the writing of specifications. Quality determinations; acceptance-sampling. Advantages to purchaser and vendor through statistical methods of control and acceptance.

Prerequisites: A first course in statistics; a college degree or equivalent in one of the sciences; statistical experience.

**750. Theories of Acceptance Sampling**

Spring, 3 credits. Offered alternate years

M. A. GIRSHICK

Review of theorems in the binomial and other topics in probability, followed by the theory of single, double, and multiple sampling. Writing instructions for actual operation. Case histories. Some theory of representative sampling. Applications of the theory of multiple sampling to various stochastic processes in physics. Use of the Shewhart control chart in conjunction with acceptance procedures.

Prerequisites: A first course in statistics; a first course in control of quality, advised; algebra; a degree in one of the natural or social sciences.

# Department of Office Techniques and Operations

## DEPARTMENTAL COMMITTEE

STROTHER B. HERRELL, Assistant Director of Personnel, Office of Personnel (Chairman)  
HENRY A. DONOVAN, Assistant Chief, Bureau of Agricultural and Industrial Chemistry  
HAROLD CLARK, Ph.D., Chief, Training Section, Division of Personnel Management, Agricultural Adjustment Agency  
JOHN S. LUCAS, Assistant Chief, Office of Plant and Operations  
EVELYN H. DIXON, Secretary to the Under Secretary of Agriculture

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*Course Numbers and Symbols*—Below 100, non-credit; 100-499, undergraduate; 500-699, graduate and advanced undergraduate; above 699, graduate. Bracketed numbers, not given this year.

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## CLERICAL-ADMINISTRATIVE PROCEDURES

The courses described under Clerical-Administrative Procedures are closely related to those offered in the Department of Public Administration and are an integral part of the program leading to the Certified Statement of Accomplishment in Administrative Procedures (see Department of Public Administration for details). They are practical, how-to-do-it courses chiefly of interest to persons in grade CAF-7 positions, or below, who are either working with these procedures, or who hope to train themselves for such positions, or positions requiring some familiarity with more than one of these procedural subjects (e.g., administrative assistants and head clerks).

### 408. Administrative Procedure

Fall, 2 credits. Repeated in Spring

ROBERT R. EVANS

Intended for persons who wish to become Head Clerks or Administrative Assistants and who wish to organize their knowledge and experience in this field with that in view. Deals with practical aspects of the day-to-day operations of the chief clerk and administrative assistant. Emphasis is placed upon matters for which these persons ordinarily are responsible, such as preparation of budget data, procedural planning, personnel actions, orientation and assignment of new employees, and supervision. The relationship of these functions to specialized services offered by the central personnel, budget, and general service units are also discussed.

### 410. Federal Auditing Procedure

Fall, 2 credits. Repeated in Spring

CAREY G. CRUIKSHANK

This short, intensive course is designed particularly to train audit clerks drawn from among employees now working in the lower grades as clerks, typists, machine operators, etc., and to assist audit clerks in their present and prospective positions. It embraces explanations of, discussions on, and practice work

with the most important types of Government vouchers and covers certain related procedures and documents. The manual used outlines in detail the various procedures.

The course covers general basic principles and definitions of terms; use of standard forms involved; General Accounting Office exceptions, and preparation of replies thereto; administrative suspensions and disallowances; application of statutes, regulations and the Comptroller General's decisions to auditing; special correspondence required in connection with such work; claims and adjustments; purchase order procedures; tax exemption; letters of authorization and travel authority; per diem allowances and computations; methods of travel; and the actual audit of Standard Form 1012 "Reimbursement" vouchers and Standard Form 1034 "Purchase" vouchers.

*Note: Persons who want a short, sped-up approach limited to minimum requirements should take this course. Persons who want more thorough training and a more comprehensive coverage of auditing procedures should take the full-year course described immediately below.*

### **411. Auditing Procedure**

Year, 2 credits each semester

CAREY G. CRUIKSHANK

Similar to the course above but more thorough in treatment of the subject. Designed to assist audit clerks in present and prospective positions and to enable Government employees working in the lower grades as clerks, typists, etc., to fit themselves for more responsible and remunerative positions. It embraces explanations of, discussions on, and practice work with all types of Government vouchers and related documents. The manual used outlines in detail all the various procedures. During the first semester, the course covers general principles and definition of terms; use of Standard Forms involved; purchase vouchers; claims and adjustments; General Accounting Office exceptions; formal and informal contracts; relation of procurement to auditing; tax exemptions; transportation vouchers; suspensions and disallowances on all types of vouchers. During the second semester, the course covers letters of authorization and travel authority; per diem computations and allowances; methods of travel; reimbursement vouchers; pay rolls; advertising vouchers; adjustment vouchers; application of statutes, regulations and Comptroller General's decisions to auditing; collections and deposits; preparation of replies to General Accounting Office exceptions, and correspondence in connection with auditing.

### **412. Federal Accounting Procedure**

Fall, 2 credits. Repeated in Spring

CHARLES L. GRANT

Designed particularly to train accounting clerks through instruction of employees now working in lower grades and to assist accounting clerks in present and prospective positions. It embraces explanation of, discussion on, and practice work with the basic ledgers (allotment ledger, objective classification ledger, and general ledger) maintained in connection with funds made available to Federal agencies. Appropriation, apportionment, allotment, disbursement, collection, and reporting processes will be discussed and the relationship between administrative accounts and accounts kept by the Treasury Department and the General Accounting Office explained. (A more advanced course, Federal Government Accounting, is offered in the Department of Public Administration.)

### **413. Office Management**

Fall, 2 credits. Repeated in Spring

DANIEL M. BRAUM

Includes office layout, office housekeeping methods, formulation of office policy, organization of communications and records, work planning and operational analysis, utilization of available facilities, care and operation of office equipment, employee orientation and supervisory techniques, methods of securing employee participation, work evaluation and employee rating. The reference text is *Textbook of Office Management* by Leffingwell and Robinson.

**414. Federal Personnel Procedure**

Fall, 2 credits. Repeated in Spring

VERNA C. MOHAGEN

Deals with basic practices and procedures designed to accomplish appointment, transfer, promotion, demotion, separation, and retirement of Federal employees. The course has three objectives: (1) to keep abreast of current developments in personnel procedures; (2) to become familiar with the legal and administrative background of such procedures (statutes, executive orders, decisions of the Comptroller General, the Civil Service Commission, and the War Manpower Commission, Administrative Orders, etc.); and (3) to visualize the constant need for streamlining procedures in the interests of simplicity and efficiency.

**415. Federal Purchasing Procedure**

Fall, 1 credit

RAY WARD

Special lecturers: J. M. Locknane, L. T. Mahurain, and J. N. Kline.

Practical training in Government purchasing from various sources of supply such as Government contracts, Treasury Procurement Schedules, Prison Industries, and surplus lists; interpretation and discussion of Surplus Property Act of 1944 and regulations and order issued thereunder, coordination of commercial and surplus property acquisitions; also theory and practice in contracting, preparation of bids, use of specifications, award of bids, source of supply contracts, and War Powers contracts. The relationship between the service of supply and related service functions such as accounting, fiscal, and budgetary will be stressed as tools in accomplishing legislative programs.

**416. Federal Budgetary Procedure**

Fall, 2 credits

HENRY G. HERRELL

This course is designed to assist employees either in budget work or preparatory to taking budget work, up to and including Grade CAF-9. It deals with budgetary procedures, including the preparation of estimates, justifications, tabular statements, graphs, etc., and, in connection with budget execution, outlines methods in making allotments, operating budgets, analysis of reports, preparation of apportionment and obligation reports, and other methods used in the formulation and execution of the Federal budget.

**417. Records Management Procedure**

Fall, 2 credits

L. E. DONALDSON, WILLIAM MULLER, and C. T. SMITH

The course embraces instruction in (1) communications, including mail handling, telegrams, messenger service; (2) records management, including planning of procedure in records units, subject filing, classification techniques, briefing and cross indexing, sorting and preparation of material folder and guide arrangement, retirement of material to inactive status, searching, tickler systems, arrangement of offices, equipment, and filing materials.

**ENGLISH FOR LETTERS AND REPORTS****418. Practical English Usage**

Fall, 2 credits. Repeated in Spring

HELEN W. WILLIAMS

This course enables students through practice to master the fundamentals of correct English. Troublesome problems of English usage, sentence structure, choice of words, style, and grammar, are studied as aids to clear and forceful writing of letters, memoranda, and reports.

**419. Vocabulary Building**

Fall, 2 credits. Repeated in Spring

SALLIE M. PEASE

Designed to help writers and speakers express ideas clearly and attractively. It embraces word study and selection, diacritical markings, synonyms and antonyms, prefixes and suffixes, usage exercises, and other means of developing a broad and useful command of words.

**420. Government Letter Writing**

Fall, 2 credits. Repeated in Spring

VERNE L. SAMSON

The writing of clear, accurate, concise, courteous letters and memoranda contributes to efficiency and economy in administration. This course gives the student (1) opportunity to work out the principles of effective letter writing; (2) practice in criticizing and revising outgoing correspondence, and in planning and drafting replies to incoming letters; and (3) drill in the fundamentals of good writing.

**90. Spelling Review**

Fall, non-credit

INEZ L. GRISWOLD

A study of helpful spelling aids and suggestions. A series of remedial reviews. Study of words so persistently misspelled that they have come to be called spelling demons.

**SECRETARIAL PRACTICES****425. Secretarial Practices**

Fall, 2 credits

MILDRED R. STEPHENS

A course designed for Government employees whose work is, or is closely related to, that of a stenographer or secretary. The purpose is to develop an understanding of what constitutes a successful job through discussion and illustration of (1) need for fundamental facts about the agency and its relationships to other agencies and the public; (2) employee's part in the agency program; (3) skills needed to perform work; (4) familiarity with available services, sources of information and other reference materials; (5) human relationships with other employees.

**SHORTHAND**

These courses are designed to furnish Federal employees an opportunity to follow a program of training for stenographic careers in the Federal service. While each course represents a separate unit of study, with emphasis on material used in the Federal service, a proper sequence of courses insures a sound foundation for successfully qualifying for the various grades and classifications of stenographers in the Federal service.

"Review of Gregg" will serve as rapid review for the student who has not applied his shorthand knowledge for a long time, or has used it so little that he feels uncertain about applying his knowledge to practical office dictation. Students finishing the beginning shorthand class may continue with the intermediate and then the "Gregg, 70 to 100 Words." Because the "Gregg, 100 to 130 Words" course is an intensive course on technical material,

students should have a sound foundation in theory and be able to write 100 words a minute with a 95 percent accurate transcript before registering for the course. Home study is required to attain goals set in course descriptions. Amount of study required varies according to the learning habits and individual goals of students.

As a general guide to assist employees who wish to plan a course of study to build for a stenographic or stenographic-reporting career in the Federal service the following parallels are drawn:

<i>Course</i>	<i>Goal</i>	<i>Prerequisites</i>
I. BEGINNING GREGG	Knowledge of theory, with writing ability of 80 words a minute on familiar material	For those who have not studied shorthand, or for those who have some knowledge of shorthand but have not completed a theory course
II. INTERMEDIATE GREGG GREGG, 70 to 100 words PITMAN, 70 to 100 words	Theory review; 80 to 100 words a minute on new, standard material	For those who have completed a course in I or an equivalent theory course
III. GREGG, 100 to 130 words	Ability to take difficult dictation at rapid rate; to record full secretarial report of conferences; and to record telephone conversations	For those who have completed a course in I and II or equivalent theory and dictation courses, and who have a minimum speed of 100 words on new, standard material
IV. GREGG, 140 to 200 words	Recording of conferences, hearings, 50 percent verbatim (or more); beginning reporting	For those who have qualified on 140 standard word test
V. GREGG, 160 words and up	Verbatim reporting	For those who have qualified on 175 word standard test or 160 word test plus additional experience and training

### 89. Review of Gregg Shorthand

Fall, non-credit. Repeated in Spring

NAOMI H. EVANS

A review of theory and brief forms. Reading from shorthand plates and students' own notes; dictation of standard material at various progressive rates of speed.

Prerequisite: Completion of the Gregg Manual or its equivalent by the functional system.

### 429. Beginning Gregg

Fall, 3 credits. Repeated in Spring

ANNA C. BOLTON

### 430. Intermediate Gregg

Fall, 3 credits. Repeated in Spring

ARTHUR S. PATRICK

**431. Gregg, 70 to 100 Words**

Fall, 2 credits. Repeated in Spring

ALICE COFFMAN

**433. Pitman, 70 to 100 Words**

Fall, 2 credits. Repeated in Spring

LOUISE C. BARRY

**432. Gregg, 100 to 130 Words**

Fall, 2 credits. Repeated in Spring

ARTHUR S. PATRICK

**435. Reporting—Gregg, 150 to 175 Words**

Fall, 4 credits

BERNARD P. FOOTE

**436. Advanced Reporting—Gregg, 175 Words and Up**

Spring, 4 credits

BERNARD P. FOOTE

**438. Shorthand in Spanish**

Fall, 2 credits

SOFIA KRISSILLAS

An elementary course covering basic principles and outlines of Spanish Gregg Shorthand Manual and progressive dictation in Spanish through supplemental exercises and business correspondence; emphasis on accuracy.

Prerequisite: Knowledge of Spanish.

**439. Advanced Shorthand in Spanish**

Spring, 2 credits

SOFIA KRISSILLAS

Dictation of business letters and commercial articles on Latin American subjects; reading of notes; incidental review of Spanish Gregg Shorthand Manual.

Prerequisite: Course 438 or equivalent.

# Department of Physical Sciences

## DEPARTMENTAL COMMITTEE

CHARLES E. KELLOGG, Ph.D., Chief, Division of Soil Survey, Bureau of Plant Industry, Soils, and Agricultural Engineering (Chairman)  
RICHARD E. MCARDLE, Ph.D., Assistant Chief, Forest Service  
ORVILLE E. MAY, Ph.D., Chief, Bureau of Agricultural and Industrial Chemistry  
ELSA ORENT-KEILES, D.Sc., Principal Nutrition Chemist, Bureau of Human Nutrition and Home Economics  
A. K. SHOWALTER, A.B., Meteorologist in Charge, Hydrometeorological Section, Weather Bureau

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*Course Numbers and Symbols*—Below 100, non-credit; 100-499, undergraduate; 500-699, graduate and advanced undergraduate; above 699, graduate. Bracketed numbers, not given this year.

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## [144.] History of Science

PAUL R. HEYL

## 145. Navigation

Fall, 3 credits

JOHN T. LOKERSON

Limited to 20, this course concerns essential principles of practical navigation, "off soundings" (exclusive of inland and coastal piloting, which is covered in Piloting).

Dead Reckoning: Includes definitions, charts, plotting, records, allowance of errors of the magnetic and gyro compasses, ocean currents, and plane, mid-latitude, Mercator, and Great Circle sailing.

Celestial Navigation: Includes fundamental definitions and principles of astronomy underlying the navigation of ships and aircraft; usage of the sextant and chronometer, time, and the nautical almanac, corrections of observed altitudes, the determination of latitude and of position at sea by lines of position computed by H.O. 211 using G.H.A., and identification of unknown navigational stars.

Prerequisite: High-school trigonometry and logarithms.

## [146.] Piloting

## CHEMISTRY

## 147. General (Inorganic) Chemistry

Year, 2 credits each semester

ROSCOE H. CARTER

Refresher course designed for students who desire a general knowledge of the subject and those who wish to bring their knowledge up to date. Aim of the course is to give students a better comprehension of the chemical aspects of our environment. The course consists of a series of lectures covering the concepts, principles, facts, and applications of general chemistry. Some organic chemistry is included. No individual laboratory work.

**148. Organic Chemistry**

Year, 2 credits each semester

C. VERNE BOWEN

Fundamental principles of general organic chemistry are reviewed. Such topics as classification, nomenclature, type reactions, and structure will be considered. Historically important discoveries are correlated with the development of the subject, and emphasis is placed upon the treatment of compounds or classes of compounds that are industrially, medically, or biologically important. The first semester is devoted to consideration of the aliphatic series; the second semester to the aromatic and heterocyclic series. Recent progress in the chemistry of sterols and vitamins is given.

Prerequisite: One year general chemistry.

**149. Physical Chemistry**

Year, 2 credits each semester

WALTER J. HAMER

Fundamental laws of chemical reactions; factors involved in determination of extent, duration, and speed of chemical reactions. Effect of heat and of light of different wave lengths on chemical reactions; properties and structure of gases, liquids, crystals, amorphous substances, colloids, and solutions in relation to their chemical behavior. Other topics include chemical equilibria, atomic and kinetic theories, the phase rule, isotopes, radioactivity, electronic theory of valence, general physicochemical laboratory methods, and electrochemistry including a study of electrode potentials, polarization and electrolysis.

Prerequisites: One year general chemistry; one year calculus; or permission of the instructor.

**522. Physiological Chemistry**

Year, 2 credits each semester

HERBERT O. CALVERY

Lecture course on principles of biochemistry. It deals with the chemistry of proteins, fats, and carbohydrates, general chemical composition of animal tissues, e.g., muscle, nerve, milk, and blood; brief discussion of enzymes of the gastro-intestinal tract; digestion and absorption of principal foodstuffs; metabolism of proteins, fats, and carbohydrates; mineral metabolism; chemical constituents of urine; and general discussion of the chemistry and physiology of the vitamins and hormones concludes the course.

Prerequisite: One year general chemistry; one year organic.

**532. Geochemistry**

Year, 2 credits each semester

HARDEE CHAMBLISS

After a brief review of pertinent principles of geology, physics and chemistry, the discussion will be primarily concerned with universal matter: the composition of the sun, of other stars, of other planets than our own, and of the crust of the earth.

Evidence will be presented concerning the composition of the core of the earth, the general character of the rocks as we pass outward from the core to the surface and the mineralogical composition of these rocks. Then will follow such topics as the internal heat of the earth, vulcanism and lavas, gases in rocks, the waters of the earth, the atmosphere and the (weathering) effects of these two agents on rocks to produce soils.

During the second semester the work will be more advanced in that the application of elementary physical chemistry to such problems as magmatic differentiation, the migration of underground materials, the genesis of ore deposits, metasomatism, accumulations of coal, of gas and of oil, will be taken up. The economic aspects of such deposits and accumulations will receive attention as will also the applications not only of geochemistry but also, to a limited extent, of geophysics to underground exploration for oil, etc.

Prerequisites: At least one year of college chemistry plus a year of college physics or geology, preferably both.

## [150.] Food Technology

HARRY W. VON LOESECKE

## [762.] Electrochemistry

WALTER J. HAMER

## Glass Blowing

(See Engineering and Mechanical Arts 188)

## GEOGRAPHY AND GEOLOGY

## [150.] Physiography of the United States

C. F. STEWART SHARPE

## 151. Geography of the Pacific Islands

Spring, 2 credits

F. RAYMOND FOSBERG

A brief introduction to the physical and economic geography of the Pacific area. Discussion will include the origin, geological history, and present geological features of the Pacific basin; the climate and vegetation; the historical sequence of peoples in the region in light of geography; economic geography by regions, including the eastern Pacific, Polynesia, Micronesia, Melanesia, Australia, Malaysia, Japan and the northwestern Pacific; the impact of European civilization on the Pacific, and its results. A fundamental purpose of the course will be to give a basis for an understanding of the present war in the Pacific.

## Economic Geography

(See Social Sciences 613)

## METALLURGY

## 152. Principles of Physical Metallurgy

Fall, 2 credits

BLAKE M. LORING

Development, meaning, and use of equilibrium diagrams for binary alloys. Iron-carbon diagrams and their relation to cast iron and steel, and to the critical points important in heat-treating ferrous alloys. Steel-treating processes depending on non-equilibrium conditions, including the S-curve. Alloy steels. Aging and precipitation hardening. Segregation and other ingot defects. Mechanical and physical tests, including the interpretation of micrographs. Non-ferrous alloys of industrial importance.

## 526. Advanced Physical Metallurgy

Spring, 2 credits

BLAKE M. LORING

Basic concepts of the physics of metals are discussed in order to develop a better understanding of the common mechanical tests and manufacturing processes. Topics include: definition of a metal; introduction to the crystalline nature of matter; classification of metallic elements according to crystalline structure; relationship between crystalline structure and physical properties; the equilibrium diagram and its relation to physical properties and crystalline structure; introduction to X-ray metallography with calculations from diffraction patterns of metals (illustrated); X-ray evidence of cold working and recrystallization; interval stresses in metals; plastic deformation; theory of metal hardening, ferrous and non-ferrous; advanced physical testing of metals covering fatigue, creep, and damping capacity. The class selects for discussion manufacturing processes of most general interest.

**[525.] Production Metallurgy**

BLAKE M. LORING

**[540.] Engineering Alloys**

BLAKE M. LORING

**SOIL SCIENCE****156. Soil Conservation**

Fall, 2 credits

J. GORDON STEELE

Physical aspects of soil conservation problems. Extent, causes, and results of soil erosion. Physical capability of land for use. Soil-erosion control, including the need for a wide variety of technical practices and measures brought together in a farm conservation plan. Soil conservation research and operations in the main physical and agricultural regions of the United States.

**157. Soil Fertility**

Fall, 3 credits. Given at Beltsville

J. K. ABLEITER

Factors that determine the fertility of the soil and its response to fertilization, liming, green manuring, and other practices are developed. Attention is given to the determination of fertilizer needs and the use of fertilizers in relation to soil conditions, crops grown, and the development of a management system on the individual farm. The properties and use of commercial fertilizer materials and mixtures are discussed.

**[531.] Soils: Their Morphology, Genesis, and Classification**

CHARLES E. KELLOGG

**[767.] Seminar: Soils and Planning**

CHARLES E. KELLOGG

**METEOROLOGY**

With the growing importance of aircraft operations in military and civilian activities, meteorology is undergoing a rapid expansion. Before proceeding on his flight, the pilot must consult the meteorologist regarding upper-air winds, cloud ceiling, threat of icing and thunderstorms, etc., along his route. Interest in meteorology has increased greatly recently and it is expected that the study of meteorology will assume greater importance in the future.

The course in Principles of Meteorology is intended for persons who desire a general outlook in meteorology and who are not interested in becoming professional meteorologists. The remaining courses are intended to give a fundamental and comprehensive meteorological background for persons interested in pursuing a career in meteorology or related fields.

A course in Introductory College Physics is offered for those who need it as a foundation for study in meteorology (see Physics 153).

**162. Principles of Meteorology**

Year, 2 credits each semester

CHARLES B. JOHNSON

A course of a descriptive nature explaining the principles of meteorology essentially on a non-mathematical basis. Especially adapted to preparation for sub-professional employment in the Government and to obtaining the basic meteorological knowledge required of a civilian pilot.

**533. Hydrology**

Year, 3 credits each semester

RAY K. LINSLEY

A two-semester course in basic and applied hydrology at the professional level. The first semester will be largely descriptive, covering such topics as elementary hydraulics; measurement and interpretation of streamflow, precipitation and other basic data; the hydrologic cycle; physics of soil moisture; the infiltration theory; wave travel and the unit hydrograph. The second semester will cover the development and application of procedures for applying basic hydrology to practical problems of river forecasting and design of water control works including such subjects as streamflow routing, flood frequency, the rational method of estimating flood magnitude, hydrometeorology, forecasting of runoff, influence of water control structures on streamflow, and problems of water control operation.

Prerequisites: Physics and Algebra; elementary meteorology, statistics, and engineering desirable.

**534. Introduction to Dynamic Meteorology**

Year, 2 credits each semester

SIDNEY TWELES, JR.

Designed to illustrate the use of higher mathematics and physics in the interpretation of meteorological phenomena, and in the development of forecasting techniques.

Prerequisite: Physical and Synoptic Meteorology or equivalent, calculus, or consent of instructor.

**536. Physical and Synoptic Meteorology**

Year, 3 credits each semester

ALEXANDER L. SHANDS

A two-semester course in the fundamentals of modern meteorology for the professionally interested student. The first semester stresses the physical aspects—atmospheric composition and structure and their measurement; gas laws; adiabatic, pseudo-adiabatic, and non-adiabatic processes; thunderstorms; fog; wind. The second semester stresses synoptic features—general and local circulations, air masses, fronts, cyclones and anticyclones, upper-air charts, forecasting. Problems involving basic units and graphic manipulations will be assigned.

Prerequisite: Physics and algebra; trigonometry and elementary meteorology desirable.

**PHYSICS****153. Introductory College Physics**

Year, 3 credits each semester

WILLIAM A. KILGORE

This course is intended for those having no previous knowledge of the subject, and for those who wish to review the elements. The class meets in the well-equipped laboratory of Wilson Teachers College.

*First semester:* Mechanics—heat—sound.

*Second semester:* Electricity—light—electronics.

**[530.] Introduction to Hydrodynamics**

MARTIN A. GARSTENS

# Department of Public Administration

## DEPARTMENTAL COMMITTEE

VERNE B. LEWIS, M.A., Assistant to the Director of Finance, Office of Budget and Finance, USDA, on military leave (Chairman)

H. DEAN COCHRAN, D.Sc., Chief, Division of Personnel Management, Forest Service, USDA

JOHN THURSTON, Ph.D., Administrative Council, USDA

BERNARD L. GLADIEUX, M.A., Executive Assistant to the Secretary of Commerce

GLADYS L. BAKER, Ph.D., Agricultural Historian, Bureau of Agricultural Economics, USDA

## OPPORTUNITIES FOR STUDY AND WORK

The modern state truly is as its officers are. Competence of personnel, especially managerial personnel, is an urgent present need and an obvious post-war imperative. Assuring and adding to that competence is the sole objective of the Graduate School.

The importance of public administration is apparent in the modern state with its emphasis on services, control, operation, and collective action in the public interest. The more the public service is called upon to assume functions previously exercised by individuals or private enterprise, the greater the importance of the principles and techniques of public administration. The unprecedented and increasing delegation of discretion to administrative agencies has raised unprecedented problems of organization, public consent, and administrative responsibility.

Washington is of necessity the national focal point of all these developments. Many of the ablest and most experienced public administrators are assembled in Washington. Many of the most competent practitioners of the various specialized branches of administration are likewise concentrated in Washington. Utilizing this unique environment and this unexcelled talent, the Graduate School offers courses geared to demonstrated needs and taught by experienced administrative personnel.

Management problems raised by the war, and aggravated by leave of administrative personnel for military duty, have created an unparalleled demand for trained men and women in all branches of administrative management. The situation has resulted in recruitment of persons from private industry, appointment of persons not so well trained and experienced as in normal times, and the promotion in some cases of meagerly trained personnel at an unusual rate. This is obviously not a normal situation, but it nevertheless illustrates the critical need for more and better training in public administration, particularly in the junior and assistant positions, even in normal times.

## SUGGESTIONS FOR PROGRAM OF STUDY

The following courses cover a wide range of approaches for varying levels of responsibility. Some give background and attitude, and some give methods and skill. Some have their objectives high and broad for perspective and knowledge of relationships; some have their objectives comparatively narrow and sharply focused for skill and ability to perform particular tasks. It is hoped that students will select those courses which supplement and complement their work assignments rather than concentrate exclusively on more intensive training in the performance of daily tasks.

*General.* Persons who have not had such a course, or varied administrative experience, should begin with Introduction to Public Administration. This course and other basic work should precede courses in special branches of administration (e.g., personnel or financial administration) in order that such courses may be of maximum usefulness.

*Personnel Administration.* Unless substantial experience can be substituted, the general course, Personnel Administration, should be taken before the specialized courses (such as Position Classification, Selection and Placement, etc.). Persons who are in positions classified as Grade CAF-5 or below and desire to prepare for personnel work should take Federal Personnel Procedure at the earliest opportunity; they should not attempt to take the specialized courses until they have gained substantial experience in personnel work or have carefully laid a foundation by completing all basic, general courses.

*Financial Administration and Purchasing.* Budget Formulation logically precedes Budget Execution. In purchasing, students qualified to work toward the program for a Certified Statement of Accomplishment in Public Administration should take Governmental Purchasing. It is desirable for other students to take Purchasing Procedure first.

*Accounting and Auditing.* Students in classification grades below CAF-5 will find it advantageous to begin with Federal Accounting Procedure or Federal Auditing Procedure. Preparation for higher-level accounting should begin with a year's study of Principles of Accounting, after the completion of which Federal Government Accounting may be taken. Second Year Accounting, Cost Accounting, Auditing, Federal Tax Accounting, Advanced Accounting Problems, and Analysis and Interpretation of Financial Statements provide advanced training for those who desire to progress further with a general accountancy program. (See program below for Certified Statement of Accomplishment.)

**CERTIFIED STATEMENTS OF ACCOMPLISHMENT**

Certified Statements of Accomplishment are offered in two fields of public administration—fields representing areas of preparation and application most useful in the public service—and in accounting.

The student who completes one of the programs outlined below is eligible to receive a Certified Statement of Accomplishment bearing the official seal of the School and signed by the Director of the School and by the Chairman of the Department of Public Administration. The Statement is not merely a diploma-like certificate nor simply a transcript of credit, but combines certain features of both. It is a certification that the student has completed a well-rounded course of study preparatory for effective public service in (1) administrative procedures, (2) public administration, or (3) accounting. Courses completed and quality of accomplishment will be recorded on the back of the Statement, which may be used as a personal record of achievement or a public record of qualification.

Certified Statements of Accomplishment are offered in the three fields described below.

**I. PUBLIC ADMINISTRATION***Approach*

Broad-gauge, essentially long-range approach to develop leadership, perspective, broad outlook, and understanding of the human factors in administration; emphasis on principles, with opportunity for study of some techniques in relation to policy.

*Objectives*

Ultimately, for policy formulation, improvement of administrative machinery, coordination of operations, and general management and control of large units. Immediately, for initial investigations as a junior member of a staff having the responsibilities named above, for assumption of increasingly difficult and more responsible assignments in these fields, and for supervision and management of small units.

*Requirements*

1. Bachelor's degree or equivalent. (Note: This requirement may be waived in the case of well-qualified students who have received a Certified Statement of Accomplishment in Administrative Procedures.)
2. Sixteen semester hours of credit in Graduate School courses in public administration, with at least four credits in each of the following fields:

- a. General Administration (courses in introductory public administration, Federal administrative management, scientific management, organization, administrative law, public relations, management psychology, etc.).
- b. Personnel Administration (courses in introductory personnel administration, position classification, selection and placement, counseling, training, employee relations, etc.).
- c. Financial Administration (budget formulation, budget execution, governmental purchasing, governmental accounting, etc.).

The program leading to a Certified Statement of Accomplishment in Public Administration should be of special interest to:

- 1. Persons already employed in responsible administrative positions. Included in this group are many with specialized training who have been transferred to administrative positions from professional positions without training or previous experience in administration.
- 2. Junior Administrative Assistants and junior administrative technicians of all kinds.
- 3. Recently recruited Junior Professional Assistants. Those who entered the service with a public administration option may profit from courses both more advanced and more specialized than those taken in college. Those who entered on various professional options and are now employed in such professions can profit very greatly from these courses if they expect, or wish to prepare, to enter into administrative work connected with their professional fields.
- 4. Employees who wish to broaden their understanding and improve their efficiency through a "tour of duty" by study, in lieu of an actual tour of duty for which they have found no opportunity.
- 5. Employees with college background who aspire to transfer to a career in administrative management.

## II. ADMINISTRATIVE PROCEDURES

### *Approach*

Emphasis on techniques, procedures, methods, but with an attempt to understand and use these means in terms of administrative ends or objectives.

### *Objectives*

Ultimately, for responsible conduct of important "housekeeping" operations of specialized character, direction of small units,

performance of most difficult and responsible tasks in the procedural aspects of administration, and the settlement of questions of intermediate importance arising out of current or contemplated operations and not covered by existing regulations or decisions.

Immediately, for effective service in some administrative procedure at the clerical or semi-clerical level, as a means of entrance into the line of promotion leading to the responsibilities named above. (Students already at this level may arrange programs in conformity with their needs.)

### *Requirements*

1. High-school diploma or equivalent.
2. Sixteen semester hours of credit selected from the following Graduate School courses:
  - a. All those offered in the Department of Public Administration (excluding all accounting courses except Federal Government Accounting). A minimum of eight credits must be selected from this group.
  - b. The following offered in the Department of Office Techniques and Operations:
    - (1) Administrative Procedure
    - (2) Purchasing Procedure
    - (3) Federal Auditing Procedure or Auditing Procedure
    - (4) Federal Accounting Procedure
    - (5) Federal Budgetary Procedure
    - (6) Federal Personnel Procedure
    - (7) Office Management
    - (8) Records Management Procedure, formerly called Communications and Records Management
    - (9) Government Letter Writing (2 credits only)
  - c. A course in elementary statistics (not exceeding 3 credits) may be included; it is not required.

The program leading to a Certified Statement of Accomplishment in Administrative Procedures should be of special interest to:

1. Persons already employed in administrative work of the procedural type, emphasizing techniques and skills.
2. Employees who aspire to enter administrative work but who, because of lack of college education, find their opportunities in that field greatly limited except at the procedural level. This program of courses is useful for persons with good native ability but limited educational background, because it pre-

pare them for a level of work most likely to be open to them. After they have succeeded in getting into administrative work, perhaps even at the clerical-administrative level, they can then combine their work-experience and study-experience to mutual advantage as progress is made toward greater responsibility. This approach is believed to be better for such persons than the common practice of attempting to circumvent the usual educational requirements by shortcut concentration on advanced and specialized courses, which are actually preparatory for responsible positions only insofar as they *supplement* broader educational background.

3. Employees who wish to prepare to become Junior Administrative Assistants or to head units concerned with administrative procedures.

### III. ACCOUNTING

The Graduate School is interested in offering accounting courses primarily as a means of training for the *public* service. For many years the School has offered elementary and advanced accounting courses; and because of increasing demands for advanced work, it is now offering a coordinated program leading to a Certified Statement of Accomplishment in that field.

The curriculum necessarily includes courses in general accounting because the basic principles are essential for government accounting. The scope of accounting in the Federal service is wide. There are increasing demands for accountants having a knowledge of commercial as well as government accounting. These demands have come as a result of the formation of many government corporations and Federal regulatory agencies. Hence, the accounting program required for a Certified Statement of Accomplishment is broad enough to cover not only the regular appropriation accounting of the Federal Government, but also the accounting training needed for many other governmental activities. The program is comprehensive enough to meet both advanced training for the government service, and also the usual educational requirements for C.P.A. examinations.

#### *Requirements*

1. High-school diploma or equivalent.
2. Forty-two semester hours of credit distributed according to the following plan:

## REQUIRED COURSES

<i>Accounting</i>	<i>No. of Semesters</i>	<i>Credits (Sem. Hrs.)</i>
Principles of Accounting	2	6
Second Year Accounting	2	6
Cost Accounting	1	3
Auditing	1	3
Federal Government Accounting	1	3
(Optional for persons not planning to enter Federal accounting work)		
Federal Tax Accounting	1	3
Advanced Accounting Problems	1	3
<i>Related Subjects</i>		
Principles of Economics	2	6
Business Law	2	6

## ELECTIVE COURSES

Analysis and Interpretation of Financial Statements	1	2
Mathematics of Finance	1	3
Budgetary and Financial Administration	2	4
Survey of Statistics	1	3
or Elementary Statistics	2	4
Federal Accounting Procedure	1	2
Federal Auditing Procedure	1	2
or Auditing Procedure	2	4

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*Course Numbers and Symbols*—Below 100, non-credit; 100-499, undergraduate; 500-699, graduate and advanced undergraduate; above 699, graduate. Bracketed numbers, not given this year.

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## GENERAL ADMINISTRATION

## 344. Introduction to Public Administration

Fall, 3 credits. Repeated in Spring

JOHN C. RUSSELL

This course is designed to introduce the student to the elements of public administration. Attention will be devoted to the evolution of administrative organization; organizational types; staff, line, and auxiliary agencies and functions; controls of administration; the broadest aspects of personnel selection, classification, training, movement, and relations; budgeting and fiscal control; federal-state relations; administrative legislation and adjudication. The object of the course is to lay a broad foundation for more intensive courses in management.

**626. Federal Administrative Management**

Fall, 2 credits. Registration limited to 20

JOHN D. MILLETT

An advanced seminar designed to aid persons who are carrying substantial administrative management responsibilities. Emphasis is placed upon the integration of all management functions and the development of a philosophy of management which is equally applicable to all phases. Lectures and discussions cover the following general topics, with particular attention to their interrelationships and interdependence; administrative planning and research; principles of organization; personnel selection, placement, training, and relations; administrative leadership, direction, supervision, and coordination; administrative reporting; budget formulation and execution; the auxiliary management services. Practical problems presented by class members for group discussion.

Prerequisite: Introductory course in public administration plus practical working experience in administrative management at level of CAF-9 or above.

**617. Administrative Law and Procedure**

Year, 2 credits each semester

CHARLES B. NUTTING

Consideration given to the following subjects: disposition, delegation, and sub-delegation of governmental powers; limitations upon administrative discretion; regulatory procedures (including hearings) of Federal administrative agencies in general and of the Department of Agriculture in particular; recent and current proposals for revision of Federal administrative procedure; and judicial review of administrative action. To the extent possible, administrative procedures of some of the war agencies also are examined.

Prerequisites: First semester or completion of Law School course in administrative law.

**624. Organizational and Procedural Analysis**

Fall, 2 credits. Repeated in Spring

TO BE ANNOUNCED

Deals with techniques employed in analysis of organizational and procedural problems and in the formulation of recommendations for the solution of such problems. Considerable emphasis is placed upon the different sets of circumstances encountered in the course of such analytical work. Specific case studies are presented for discussion. Admission to the course is restricted to persons who have had several years' administrative experience.

Prerequisite: Consent of instructor, through Graduate School office.

**Administrative Procedure***(See Office Techniques and Operations 408)***PERSONNEL ADMINISTRATION****661. Personnel Administration**

Fall, 2 credits. Repeated in Spring

O. GLENN STAHL

Deals with personnel problems which arise when people are associated together in a work situation. It is designed to acquaint the student with the basic personnel policies and practices found necessary and useful in coping with these problems. Trends in public personnel administration and its relationship to over-all management are discussed. The course will be helpful to supervisors and administrators who desire a broad understanding of personnel administration and also to students who need foundation for the more specialized courses in the personnel field.

Prerequisite: 60 semester hours of college, grade CAF-4 in personnel work, or consent of instructor.

**842. Personnel Administration**

Fall, 2 credits. Repeated in Spring

LOUIS J. KROEGER

A graduate course dealing with the same problems and content described in the undergraduate course listed immediately above.

Prerequisite: Bachelor's degree or employment in personnel work at grade CAF-7 or above.

**659. Position Classification**

Fall, 2 credits. Repeated in Spring

ROBERT L. HILL

An introductory course designed to give the student an understanding of the fundamental concepts of position classification and its uses; the relation of classification to compensation and other phases of personnel administration; the historical background of position classification in the Federal service; an analysis of the Classification Act of 1923 and its amendments and its relation to other personnel processes; position analysis and factors to be considered in the allocation of positions.

Prerequisite: 60 semester hours of college work or consent of the instructor.

**843. Advanced Position Classification**

Fall, 2 credits. Repeated in Spring

JAMES L. BUCKLEY

A study of the practical administration of the Federal classification plan. Emphasis will be placed on the actual methods, policies, and practices that influence allocation of positions. Specific positions and their allocation factors will be discussed.

Prerequisite: Course 659 or equivalent experience.

**630. Selection and Placement**

Fall, 3 credits

ARTHUR B. MCLEAN

Recruiting, evaluation, probation, placement, and promotion of employees, with special reference to the Federal civil service; lectures and discussions.

**631. Employee Relations and Counseling**

Fall, 2 credits. Repeated in Spring

JACOB H. MASON

Deals with the organization and operation of a program of employee relations and counseling in the Federal service. Emphasis on methods and techniques of both preventive and remedial employee relations; counseling and dealing with grievances. Organization for and methods of dealing with (1) individual problems of adjustment both to work environment and to off-the-job environment, and (2) group problems and relationships, employee organization and representation, and appeals procedure.

**639. Employee Training**

Fall, 2 credits

ERWIN R. DRAHEIM

This course is designed to aid those who have the responsibility for training employees or developing in-service training programs. It will treat general content applicable to any Government agency, such as: how the supervisor can do a better job of program planning and training subordinates; how to train for effective-writing programs; how to get employees to use simplest way of doing their work; orientation of employees; how to aid employees to make adjustments to changes brought about by the war and peace.

**[629.] Tests and Measurements in Personnel Administration**

**[663.] Legal Aspects of Investigations—Criminal Evidence and Procedure**

RALPH KOEBEL

**Techniques of Interviewing and Questionnaire Construction**  
(See Social Sciences 736)**The Conditions of Personality Growth**  
(See Social Sciences 342)**Federal Personnel Procedure**

(See Office Techniques and Operations 414)

**BUDGETARY ADMINISTRATION****635. Budgetary and Financial Administration: Budget Formulation**

Fall, 2 credits ALLEN MANVEL and Special Lecturer WILLIAM A. JUMP

First part of an advanced, two-semester program covering the broad phases of budgetary and financial administration in the Federal Government. Several officials from bureau and department budget offices, and other budgetary and financial organizations will lecture and lead discussions.

The course deals with the pre-appropriation phases of budgeting, including formulation, review, and congressional enactment of the budget. Topics discussed include: history, development, and purposes of budgeting in the United States and other countries; Federal budgetary and fiscal policies in relation to the national economy; the role of budgeting in program formulation; the role of bureaus, departments, Bureau of the Budget, the President and Congress in budgeting; content of the Budget; the investment and capital-outlay budgets; review and analysis of budget estimates; budget justification; legislative-administrative relationships in budgeting.

Prerequisites: Experience in budgetary or financial administration, courses in public administration, or consent of instructor.

**636. Budgetary and Financial Administration: Budget Execution**

Spring, 2 credits VERNE B. LEWIS and Special Lecturer WILLIAM A. JUMP

This is the second part of an advanced two-semester course covering the broad phases of budgetary and financial administration in the Federal Government. Several officials from bureaus and department budget offices, and other budgetary and financial organizations, lecture and lead discussions.

This semester deals with the execution of the budget after being enacted by Congress and the relationships of administrative planning and control, accounting, auditing, and financial reporting to budget execution.

Prerequisites: Experience in budgetary or financial administration, courses in government or public administration, or consent of instructor.

**PURCHASING****637. Governmental Purchasing**

Year, 2 credits each semester S. A. SNYDER and J. K. KNUDSEN

This course is primarily designed for employees who are or desire to be engaged in purchasing activities for the Federal Government and persons who

sell goods and services to the Government. It deals with the procedure, economics, and law (from a layman's viewpoint) relating to such purchasing. Among the topics considered are: the organization and management of purchasing offices and Government warehouses; the nature of public contracts and how they differ from private contracts; specification writing; the analysis of market conditions with reference to Government purchasing; the effect of numerous laws such as the Walsh-Healy Act, the Bacon Davis Act, and the Eight Hour Law; the place and functions of the General Accounting Office and the Procurement Division in the purchasing scheme; and practices under wartime conditions, including a review of the war powers relating to purchasing, renegotiation, termination, and cost-plus-fixed fee contracts. Leading specialists will be invited to discuss selected technical phases.

The course is so arranged that attendance at either semester will add to the student's knowledge and credit will be given on a semester basis. No subject matter, however, will be repeated.

### 638. Surplus Property and Reconversion

Fall, 3 credits. Repeated in Spring

JAMES R. WILSON

Covers in considerable detail the rules, practices and problems pertaining to renegotiation and reconversion, including termination of contracts and surplus property. Statutes studied are the Renegotiation Acts of 1942 and 1943, the Contract Settlement Act of 1944, the Surplus Property Act of 1944, and the War Mobilization and Reconversion Act of 1944. Among the administrative regulations and practices to be examined will be those of the War Contracts Price Adjustment Board, the Office of Contract Settlement, the Surplus Property Board, and the Office of War Mobilization and Reconversion, as well as the pertinent ones of the major procurement agencies. Advantage will also be taken of collateral and background material in reports, current periodical publications, etc.

(This is a modification of the former course, Government War Contracts.)

### Federal Purchasing Procedure

(See Office Techniques and Operations 415)

### ACCOUNTING

*See page 57 for a suggested program of study and for the requirements for a Certified Statement of Accomplishment in Accounting.*

### 352. Principles of Accounting—First half

Fall, 3 credits. Repeated in Spring

WILLIAM H. ROWE  
WILLIAM L. DYE

Elementary principles of accounting; discussion and problems. At the end of the semester students will be prepared to do the accounting necessary for a small business organization; i.e., keep a complete set of books, draw up statements at the end of the fiscal period, adjust the accounts for accruals, deferred items, depreciation, etc., and close the books.

### 352. Principles of Accounting—Second half

Fall, 3 credits. Repeated in Spring

WILLIAM K. BROWNOLD

Continuation of first half covering more advanced principles of accounting; accounting for partnerships, corporations and manufacturing; depreciation policies and analysis of financial statements.

**353. Second Year Accounting**

Year, 3 credits each semester

WARNER H. HORD

First semester: Advanced principles of manufacturing accounting, corporation accounting, and valuation as applied to current assets, fixed assets, intangibles, and liabilities, reserves and funds, installment sales.

Second semester: Advanced principles of partnership accounting, including formation, operation, and dissolution; joint ventures; consignments; agencies and branches; consolidated balance sheets and income statements; application of funds; accounting for insolvent and bankrupt concerns; estates and trusts.

Prerequisite: First semester or equivalent.

**354. Federal Government Accounting**

Fall, 3 credits. Repeated in Spring

CHARLES N. MASON

A review of the development of the accounting system for Federal funds and a detailed study of appropriation, fund, receipts, and governmental corporation accounting. Special emphasis is given to the accounting problems of administrative agencies. The Treasury Department and General Accounting Office relationships to the accounting system are covered. Specialists in their respective fields assist in the course.

Prerequisite: One year of basic accounting or Federal Accounting Procedure, or one year of experience with the Federal system of accounting.

**642. Cost Accounting**

Fall, 3 credits

TO BE ANNOUNCED

A thorough and comprehensive treatment of the principles of cost accounting, together with the methods of their application to specific problems. By means of lectures, textbook study, and problems, full consideration is given to the methods of cost accounting for materials, labor, direct and indirect expenses in their relationship to specific job orders; process, departmental and standard costs; and the control accounts.

Prerequisite: Principles of Accounting.

**645. Federal Tax Accounting**

Fall, 3 credits

ROY H. HALQUIST

Federal taxation presented from the accounting viewpoint. Special attention given to income taxation. It is desirable that those admitted to the class have had education or experience in accounting.

**643. Auditing**

Spring, 3 credits

AARON H. CHUTE

The purposes and types of audits are studied. Consideration is given to such problems as the planning and performing of audits, principles and auditing of different types of audits, audit working papers and reports, and responsibility of the auditor.

Prerequisite: Second Year Accounting.

**[646.] Advanced Accounting Problems****[647.] Analysis and Interpretation of Financial Statements****Federal Accounting Procedure**

(See Office Techniques and Operations 412)

# Department of Social Sciences

## DEPARTMENTAL COMMITTEE

FREDERICK V. WAUCH, Ph.D., Assistant Deputy Director, Office of Marketing Services, USDA (Chairman)  
SHERMAN E. JOHNSON, Ph.D., Head, Division of Farm Management and Costs, Bureau of Agricultural Economics, USDA  
RENSIS LIKERT, Ph.D., Head, Division of Program Surveys, Bureau of Agricultural Economics, USDA  
JAMES G. MADDOX, M.A., Special Assistant to Chief, Bureau of Agricultural Economics, USDA  
J. MURRAY THOMPSON, Ph.D., Assistant Director, Western Division, AAA, USDA

## PURPOSE AND SCOPE

Social science deals with *people* and the problems of human relationships, as contrasted with natural or physical science which deals with *things* and the problems arising out of physical relationships.

The problems of social organization and operation have become both absolutely and relatively more important with the increase in complexity of our industrial civilization. More and more, people are concerned with the organization and regulation of production, the distribution of goods and income, and with price policies. The individual as a consumer and investor, the businessman and the farmer as producers, find increasing need for a knowledge of economics and other social sciences. Large corporations are employing growing numbers of economists to help in the formulation of policy. Psychologists and social workers are finding a demand for their services in personnel work. And, the tremendous growth in Federal, state and local government organization calls for many more people adequately trained in social science.

Social science is divided into a number of closely allied fields including economics, sociology, political science, history, law, and psychology. A broad grasp of any one of these subjects implies at least some familiarity with the others, because of the many interrelationships among these social studies. Yet the continued development of each social science has given rise to larger and still larger bodies of knowledge relating to it, until only through a considerable degree of specialization can the student hope to master any one part. Thus the great need is for people who have concentrated sufficiently on one phase of a social science, such as money and banking in economics, to be thoroughly familiar with the details of fact and principles involved, yet who also have a broad underlying training in the allied social science fields. The courses offered by the Graduate School are designed to aid in acquiring such a general background in the social sciences, as well as the spe-

cialized training in particular fields which is necessary for successful work in many Government departments and in private business.

Not all of those engaged in occupations connected with the social sciences, however, can hope to attain such a complete general as well as specialized background, at least for some time to come. They will be interested, rather, in courses designed to fit them better for doing some specific job which is not connected with policy formation or general administration. An employee in the personnel office of a Department of Agriculture Branch responsible for market news and inspection services may wish to take a course in Advanced Marketing in order to learn something about the subject matter dealt with by the personnel of the Branch, or a course in psychology as an aid in dealing with the personal problems which are daily presented to employee counselors. The secretary to an economic research director may want a course in the principles of economics in order to become familiar with the terminology and general economic concepts to which her stenographic and filing duties relate. An almost unending array of job needs of this kind offers opportunities to the alert and ambitious employee to increase his capacity and usefulness to his employer. The many promotions within the Government service which can be traced directly to such training testify to the fact that study in the social sciences is profitable.

About half the courses offered in the social sciences deal with economics, including not only courses in theory and principles, but also applied economics in several fields such as agriculture, labor, transportation, banking, taxation, and economic geography. These courses deal with the business side of life; that is, with the science and art of making a living. Special emphasis is given to the analysis of government policies which affect prices, production, and methods of doing business.

Fewer courses are offered in the other specialized fields within the social sciences. The Graduate School believes that all students doing serious work in the other social sciences should have a good grounding in economics. Such students will find several useful and important courses in most of the other fields, but in many cases if they want to specialize in such subjects as sociology, political science, law, history, or psychology they will need to supplement their work in the Graduate School with courses taken in other institutions.

#### GROWING NEED FOR TRAINED WORKERS

In recent years, governments have been taking a more active part in the regulation of economic and social life. During the war such

controls are necessarily strengthened and increased until they affect almost all economic and social activity. After the war many of these controls doubtless will be relaxed or dropped, but it is quite clear that the underlying trend is not likely to be reversed although there may be temporary counter trends. In this country the State and Federal Governments doubtless will be called upon to carry out a number of broad post-war programs dealing with such matters as processing, production, distribution, taxation, employment, monetary and fiscal policy, the regulation of business practices, and international trade.

It is extremely important that government policies, both during the war and after the war, be based on competent studies. To forecast accurately what will happen and to point out clearly the good and bad effects which may result from any proposed course of action is the major service which social scientists may render the people.

Washington is an excellent place to study problems of this kind. The principal Federal programs in the economic and social fields are administered in Washington and new proposals always are being considered both by the Congress and by the agencies responsible for the programs. Moreover, Washington is growing in importance as a center for the discussion and actual administration of international programs.

#### SUGGESTIONS FOR PROGRAM OF STUDY

The School offers a rather wide range of courses in the social sciences. This is necessary because of the breadth of the field and the need for a considerable degree of specialization in several of the sub-fields.

All students in the social sciences should have a few general foundation courses. If the student has not already had such courses, he should take them as soon as he begins his work in the social science department.

It is also advisable for most students in this field to know something about statistics. This is not an absolute requirement for all courses in the social sciences, but students will find that a grasp of elementary statistical methods is extremely useful in most studies in this field and is indispensable for many of them.

Most students in the social sciences will want to specialize in some specific field. The courses are arranged to provide such specialization, but students should remember that these sub-fields are not entirely separate and distinct from one another. They will have to avoid two evils—that of overspecializing, and that of getting a smattering of a wide variety of topics within the broad field

of the social sciences. For that reason, students who take a large number of courses in one particular sub-field should also enroll in some of the advanced courses in theory and principles of their particular disciplines and at least a few courses in other specialized fields which are fairly closely related to their own.

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*Course Numbers and Symbols*—Below 100, non-credit; 100-499, undergraduate; 500-699, graduate and advanced undergraduate; above 699, graduate. Bracketed numbers, not given this year.

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## ECONOMICS

### **328. Principles of Economics**

Year, 3 credits each semester

FREDERICK L. THOMSEN

An examination of the nature, validity, and significance of the "fundamental principles of economics." The course is designed to give the student the understanding of basic concepts necessary for advanced study in the field of economics and for the better understanding of materials dealt with in applied courses. The relation between economic theory and scientific methods. The organization of the economic system: production, consumption, exchange, and the distribution of income and wealth. The relation between economic institutions and so-called economic laws. Although the significance of basic principles will be interpreted in relation to current events and problems, the course is primarily designed to furnish an understanding of the scientific aspects of economics which have continuing application under changing world conditions.

### **548. International Economic Controls**

Fall, 2 credits

JEAN PAJUS

A survey of international combines and cartels; their nature and their implications for international government. Contemporary problems of international monopolies and competition; governments and private-control agreements. Case methods will be used to develop discussion, with primary emphasis on international economic problems involved in the collective monopolies of entrepreneurs as sellers and producers.

### **672. Income, Living Standards and Democracy**

Fall, 2 credits

RAINER SCHICKELE

Discussion will focus upon central issues of economic policies regarding full employment, creation of national income, and mechanism by which income is distributed among the people according to occupations and regions. Measurements of real income and living standards; minimum standards of decency regarding essential goods and services as a goal of public policy; major economic problems in the transition from war to peace with special emphasis on agriculture in its relation to the national economy; democracy's obligation to improve income distribution, economic security, and equality of opportunity.

### **[692.] Econometrics: Mathematical and Statistical Analysis of Economic Problems**

R. O. BEEN

**807. International Financial and Trade Policies**

Fall, 2 credits

OSCAR ZAGLITS

The course analyzes problems of international commercial and financial policies, particularly possible patterns of such policies under economic conditions that may prevail in the post-war period. The problems discussed include: free trade versus industrial and agricultural protection; dumping and foreign trade subsidies; trade restrictions by tariff versus trade restrictions by quotas, exchange control, and other administrative devices; efforts of the United States trade policy to secure equality of treatment in the face of regional, empire, and other preferences; bilateral versus multilateral trade; stable versus variable exchange rates; international reconstruction policies after this war (critical analysis and discussion of proposals for international monetary stabilization, world clearing systems, international lending, international commodity agreements, etc.).

The course will be valuable to those who are or may be concerned with international policies (tariffs, foreign trade, foreign agriculture, etc.) or with monetary and financial problems; it will also benefit those who expect to go abroad in the service of the United States Government or other institutions.

**813. Seminar in International Financial and Trade Policies**

Spring, 2 credits

OSCAR ZAGLITS

This seminar is intended for a discussion of (1) interwar and wartime developments in the field of international trade and finance and (2) prospects as to post-war international economic policies (e.g., the probable trade policies of the United States, the United Kingdom, the British Commonwealth, Soviet Russia, Latin America, Continental Europe, and Asia; the plans for facilitating international monetary cooperation and international investment; international commodity agreements and buffer stock operations; and international cartels).

Prerequisite: Course 807, or an equivalent graduate course.

**579. Research Methodology in Economics**

Spring, 2 credits

MICHAEL T. WERMEL

This course is designed primarily for the economist and economic statistician who is engaged in economic and statistical research. The aim is to acquaint the students with the application of the basic principles of scientific method to concrete research problems and also with the art of preparing written reports embodying the results of their investigations.

**597. History of Economic Thought**

Year, 3 credits each semester

MAX J. WASSERMAN

An examination of the principal economic theories from Greek antiquity to the present time in the light of the institutions, customs, and practices that conditioned them.

**809. Price Analysis**

Spring, 3 credits

FREDERICK L. THOMSEN

The analysis of commodity prices and of the supply and demand conditions affecting them. Price forecasting. The application of analytical techniques in handling price problems of government and private business. Agricultural commodities are mostly used for illustrations, but the methods are generally applicable to industrial commodities. This is not a course in statistical methods or economic theory, but in their application to practical problems in the field of prices.

Prerequisites: Principles of Economics and Elementary Statistics.

**810. Economics of Imperfect Competition**

Year, 3 credits each semester

MICHAEL T. WERMEL

This course will commence with a critical reexamination of basic premises underlying the traditional theory of price determination, as an introduction to an intensive study of newer theoretical techniques, developed recently, for the analysis of prices under conditions that fit neither assumptions of "perfect competition" nor of "pure monopoly" and that have been described as conditions of "monopolistic" or "imperfect" competition. In the second semester, the usefulness and applicability of this theoretical apparatus will be tested by a study of actual institutional practices, of price determination in specific markets in industries such as rubber tires, agricultural implements, drugs, meat packing, fertilizer, canning, etc., where admittedly neither "perfect competition" nor "pure monopoly" prevails.

**829. Contemporary Price Theory**

Fall, 2 credits

BURNHAM P. BECKWITH

This course will deal with the major developments in price (value) theory since 1930. It assumes familiarity with neo-classical marginal utility analysis and covers theories which build upon this foundation rather than attempting to overthrow or displace it. The principal developments to be covered are (1) the theory of monopolistic competition (Chamberlain, Dennison & Galbraith), (2) the theory that prices should equal marginal costs in industries of declining costs (Hotelling, Lerner, Meade), and (3) recent attempts to apply marginal utility theory to the economic problems of a planned or collectivist economy (Lerner, Lange, Dickinson, Hall, etc.). Special attention will be given to the practical application of these theories to problems of government control.

Prerequisite: Bachelor's degree with major in Economics.

**832. Problems of Reconstruction and Full Employment**

Year, 2 credits each semester

MORDECAI EZEKIEL

*First Semester*—Domestic Problems. Industrial distortions caused by the war, and structural problems of converting to peace, with special reference to manufacturing and construction; problems of providing adequate buying power in the reconversion period, possible post-war boom, and subsequent period, without deflation or inflation; proposals for sustaining employment (Beveridge, Wallace, and Murray Bill), and their ramifications; Are 60 million jobs possible; local and regional aspects of full employment; efforts under way, private and governmental, to assure employment (National Planning Association, Committee for Economic Development, labor unions, etc.).

*Second Semester*—International Problems. Problems of post-war reconstruction in various countries, and efforts to deal with them; longer-range possibilities of expanding trade and production; international proposals to create an expanding economy (Hot Springs, Bretton Woods, foreign trade, etc.), their possibilities and difficulties.

Prerequisites: Master's degree in social sciences, or equivalent practical experience.

**AGRICULTURAL ECONOMICS****580. Social and Economic History of American Agriculture**

Fall, 3 credits

EVERETT E. EDWARDS

The geographical basis of American agriculture; agrarian settlement; land policies; the agricultural revolution, its elements and significance; history and significance of farm implements and machinery; agricultural development by regions and commodities; transportation and marketing agencies promoting agriculture, including individual leadership, societies, fairs, periodicals, State and Federal departments, education, and sciences; farmer movements; agriculture in recent times.

**550. Postwar Agricultural Policies**

Fall, 2 credits

ORIS V. WELLS

An analysis of agricultural conditions following World War II with especial attention to adjustments needed and alternative policies which might be adopted. The course will include an examination of the development of agricultural policy to 1939, the effect of World War II, trends affecting both the supply of and demand for agricultural commodities and shifts and adjustments which may be needed following the end of the war, current developments in the field of postwar planning, agriculture's stake in full employment, and the arguments for and against alternative agriculture policies relating to prices, production, standards of living, and conservation which might be followed during the decade ahead.

**581. Comparative World Agriculture**

Spring, 3 credits

CLAYTON E. WHIPPLE

A survey of countries of strategic agricultural importance including France, Germany, Denmark, Italy, Russia, the Danubian countries, China, India, Australia, Argentina, and Canada. Each country will be studied in terms of climate, topography, soils, types of farming regions, crop and animal enterprises, markets and transportation, foreign trade, and probable position in the post-war agricultural picture.

**586. Land Economics**

Fall, 3 credits

V. W. JOHNSON and JOHN TIMMONS

A survey of economic principles governing utilization of major land types, including an appraisal of present land resources and future need for various types of land and land uses, traditional practices and customs that affect land use, private and public land ownership and tenancy relationships, problems of new settlement, land income under different conditions of ownership and management, and of various State and local measures for the direction and control of land use and occupancy.

**688. Current Land Policies**

Spring, 2 credits

V. W. JOHNSON and JOHN TIMMONS

Discussion of current land problems and policies in the United States and various foreign countries; land use control programs; public land management policies; tenure reforms; government land programs to meet war problems.

**671. Federal Crop Insurance**

Fall, 1 credit

WILLIAM H. ROWE and M. ELDON COLBY

This course will consist of lectures and discussions covering the various phases of crop insurance. The lectures will be given by various persons and be coordinated by the instructor. Material covered will include a study of crop losses and the need for insurance, crop insurance in foreign countries, early crop insurance by private companies in the United States, principles underlying the program, methods of operation, actuarial methods, insurance experience, problems encountered and new developments.

**[585.] Farm Management and Production Policies**

S. E. JOHNSON and W. D. GOODSELL

**[587.] Seminar in Land Economics Research**

V. W. JOHNSON

**Statistics of Crop Estimating**

(See Mathematics and Statistics [737])

**Cotton Classing**

(See Engineering and Mechanical Arts [191])

**AGRICULTURAL MARKETING****333. Elements of Agricultural Marketing**

Year, 3 credits each semester

H. M. SOUTHWORTH and F. V. WAUGH

This is a general background course intended to give students an introduction to the most important problems of Agricultural Marketing. The main functions of Marketing are described and analyzed in detail. Marketing Specialists are brought in to show how general principles of Marketing can be applied to the principal agricultural products.

**667. Problems and Policies in Agricultural Marketing**

Year, 2 credits each semester

R. O. BEEN and subject specialists

Chief emphasis will be placed upon applications of analytical methods of economics and statistics to important problems and policy questions encountered in marketing agricultural products. Relevant principles of economic theory will be reviewed and developed as needed. Topics to be discussed include: producer and consumer cooperatives in relation to limited competition, location of industries and determination of market and supply areas, differential pricing, export policies, government taxation and subsidies, stabilization of prices and supplies, distribution programs, grades and standards, price supports and controls, rationing, speculation, optimum organization of marketing enterprise, waste in marketing, etc. Specialists working in related fields will assist in lecture and discussion.

Prerequisites: Elements of marketing or suitable experience and elements of economics. For graduate credit, economic theory and statistics will also be required.

**610. Consumer Cooperation**

Fall, 2 credits

VALERY J. TERESHTENKO

Analysis of the role consumer cooperation has played in the social and economic life of Europe, Latin America, and in urban life in the United States of America. After brief study of the evolution of the theory of cooperation, attention will be focused on its application in the fields of credit, housing, health, education, etc. Particular attention will be paid to consumer cooperation in Sweden, Switzerland, and Great Britain, to credit cooperatives in Germany and India, to group health associations in Poland and Yugoslavia, and to industrial cooperatives in China. Emphasis will be placed on cooperatives in countries of primary importance to the United States in the post-war period, and on social implications of consumer cooperation in the post-war economy.

**668. Agricultural Cooperation**

Spring, 2 credits

WARD W. FETROW and HAROLD HEDGES

This course includes the history, philosophy, and economic concepts of the cooperative movement; and study and evaluation of the major developments in this country of various types of marketing, purchasing, and service associations. These will be approached through actual case situations. Emphasis will be placed on the possible role of cooperatives in the post-war period.

**[693.] Marketing Services and Regulatory Activities**

S. R. NEWELL

**[589.] Cotton Marketing**

J. W. WRIGHT

## LABOR ECONOMICS

**595. Organized Labor and the Law**

Fall, 3 credits (18 weeks)

DAVID ZISKIND

This course is designed to develop an understanding of the functioning of law and government agencies in the field of labor relations. It will present an analysis of statutes and judicial decisions on the organization of trade unions, the incidents of union membership, collective bargaining, strikes and lockouts, picketing, boycotts, blacklists, conciliation and arbitration, and trade union responsibility. Attention will be given the administrative procedure of the National Labor Relations Board and the State labor relations boards.

**593. Labor and Social Legislation**

Spring, 3 credits (18 weeks)

DAVID ZISKIND

This course deals with the problems of the individual worker and the progress of social legislation designed to improve his labor standards. It reviews the legislation on child and woman labor, safety and health, accident compensation, wage payment and collection, minimum wages, maximum hours, unemployment insurance, and old-age pensions. Attention will be given the administrative techniques of the Social Security Board, the Railroad Retirement Board, and the Wage-Hour Division of the Department of Labor, as well as the various State labor departments.

**[594.] Settlement of Labor Disputes**

DAVID ZISKIND

## ECONOMIC GEOGRAPHY

**[613.] Economic Geography**

CLAYTON E. WHIPPLE

**614. Economic Geography of Europe**

Fall, 2 credits

CLAYTON E. WHIPPLE

A seminar course dealing with the human and economic geography of Europe. A survey of man's occupation and utilization of the resources of the continent will be made including agriculture, forestry, fishing, manufacturing, and other important occupations of the continent. An important element will be a survey of probable social-economic post-war adjustments.

## POLITICAL SCIENCE AND HISTORY

**549. Problems of Reconstruction in Germany**

Fall, 2 credits

FRITZ MORSTEIN MARX

The course attempts to identify and analyze the issues and problems likely to arise in the reconstruction of Germany, with a view to both the traditional frame of political, administrative, social, and economic institutions and the major influences which may be expected to impress themselves on postwar Germany. Special attention will be given to the international implications of Germany's postwar development in terms of the respective national interests of the Great Powers and the organization of a peaceful international order.

**607. Problems of International Government**

Fall, 2 credits. Repeated in Spring

GEORGE L. RIDGEWAY

This course is a systematic study of the problems arising in world society out of the clashes of national interests. An examination of the intellectual background and historical development of the idea of collective security, with heavy emphasis on the League of Nations, the new United Nations organization based on the San Francisco and Dumbarton Oaks conferences; UNRRA; and other international machinery contemplated in the Bretton Woods agreement, the Food and Agriculture Organization, and the regional pacts. An analysis of the problems of control of competitive armament, economic nationalism, and culturally backward areas. In general, the course undertakes to develop the relations between the dynamic forces of contemporary international life and the effort to effect an organization competent to control these forces by collective power.

**608. World Politics**

Fall, 2 credits. Repeated in Spring

TO BE ANNOUNCED

A survey of world affairs and international relations. Such topics will be considered as the origins of the World War of 1914-18, the Versailles Conference and the treaties that brought no peace; revolution in Germany and Russia; the conditions that gave rise to Mussolini and Hitler; the nature of Nazism, Fascism and Communism; the breakdown of the peace machinery; the war; basic issues in the Far Eastern situation; problems and prospects of Pan-Americanism.

**691. Pressure Groups in Government**

Fall, 2 credits

JASPER B. SHANNON

The nature, causes, organization, and activities of various large pressure groups including business, labor, and agricultural bodies. The impact of pressure groups upon the legislative and administrative processes. The significance of pressure groups for the future of American governmental organization and for democratic government in general.

**600. Contemporary Russia**

Fall, 2 credits

VALERY J. TERESHENKO

Beginning with a brief summary of political, social, and cultural life in Imperial Russia, this course will place major emphasis upon Russia since the Revolution. The survey will include description of Russia's natural resources, and an analysis of Soviet planned economy in relation to agriculture, industry, transportation, and distribution. Some treatment will be accorded the cultural and geographic regions of Russia with a final discussion of the role of the U.S.S.R. in World War II.

**602. Contemporary China**

Fall, 2 credits

I-MIEN TSIANG

This course is designed to give an understanding of modern China. Among the topics to be studied are the social, economic, and political developments since 1911; the political parties and leaders; and the present war-time conditions.

**606. Philippine Reconstruction**

Spring, 2 credits

LEOPOLDO T. RUIZ

A study of social problems likely to prevail in the Philippines at the close of the present war. A survey will be undertaken of the socio-economic problems during the American regime such as those arising from agricultural land utilization, farm tenancy, trade and commerce, and the Philippine independence movement. The socio-economic planning of the Philippine Commonwealth and its

bearing on the post-war period including proposed solutions such as the cooperative system and government-owned corporations will be discussed. The American democratic policy as a factor in group awareness to the adverse social and economic conditions will be stressed throughout the course.

### 669. Contemporary Japan

Spring, 2 credits

JOSEPH G. YOSHIOKA

After a brief summary of the evolution of the Japanese people, this course analyzes the principal political, economic, social, religious, and educational institutions of present-day Japan. The chief purpose is an objective appraisal of the most important aspects of current Japanese living.

### [339.] Recent American History

WESLEY M. GEWEHR

### [599.] The Balkans and Near East

CLAYTON E. WHIPPLE and AFIF TANNOUS

### [813.] Contemporary Political Thought

### Social and Economic History of American Agriculture

(See Agricultural Economics 580)

## PSYCHOLOGY

### 342. The Conditions of Personality Growth

Fall, 2 credits. Repeated in Spring

DWIGHT H. CHAPMAN

This course treats the principal factors influencing personality development: physiological bases, infantile and childhood experiences, and cultural determinants. It considers both experimental and clinical contributions to the theory of personality and the application of those to practical problems of interpreting and dealing with people.

### 736. Techniques of Interviewing and Questionnaire Construction

Fall, 2 credits

CHARLES F. CANNELL

Study of the theory and practice of interviewing and questionnaire construction with special emphasis on investigation of attitudes as used in public attitude research. Consideration is given to various interviewing methods, including interviewing as applied to personnel work and counseling, and to principles of questionnaire construction. Emphasis is laid on practical field procedures and problems.

### 590. Social Psychology

Fall, 2 credits

EDGAR A. SCHULER and CARL C. TAYLOR

A general and introductory course on the social aspects of personality, social interaction and collective behavior. It includes treatments of cultural conditioning of personality, personality measurement, communication, public opinion, propaganda, censorship, mobs, riots, and social movements.

### 591. Rural Social Psychology

Spring, 2 credits

CARL C. TAYLOR and EDGAR A. SCHULER

A specialized course on the social psychology of rural people. Particular attention will be given to such topics as rural isolation, the reign of tradition and custom, farmers' public opinion, and farmers' movements.

## SOCIOLOGY

**611. La America Latina y los Estados Unidos**

Year, 2 credits each semester

PHILIP L. GREEN

Lectures and discussions in Spanish.

This course provides an opportunity to achieve greater facility in Spanish, while acquiring useful and interesting information on the life of the Latin-American countries and their relations with the United States.

The first semester analyzes racial, geographic, economic, and political forces that have shaped Latin-American developments; and surveys important contributions of Latin-American literature, art, music, social legislation and other spheres of human activity. The second semester embraces fundamental trends and influences for and against inter-American friendship, from earliest times to the present day. It describes official and non-governmental inter-American relations, presents problems and indicates opportunities facing the Americas today. Registration is limited to students who have had the requisite instruction and practice in Spanish. Those who are in doubt as to their adequacy in this regard are advised to confer with the instructor before registering.

**655. Population**

Fall, 3 credits

CONRAD TAEUBER

Assisted by IRENE B. TAEUBER, PHILIP M. HAUSER

Changing growth, distribution and composition of world population, the United States within a world setting; the people of the United States today—number, distribution, social, economic and national composition; birthrates, death rates, and natural increase; international migration; internal migration, and movement within both rural and urban areas; the impact of the war on the American population; the future population of the United States; social and economic aspects of population growth; population policies, implicit and explicit.

**815. The Cultural Regions of the United States**

Fall, 3 credits

CARL C. TAYLOR

This course is a study of the cultural regions of the United States covering in detail the characteristics of the various regions and subregions and their inter-relationships, including settlement patterns, social organizations and institutions, prevailing ideologies, modes and folkways, and dominant attitudes and opinions of the people who live in the rural areas of these cultural regions.

**817. Community Organization**

Fall, 3 credits. Repeated in Spring

DOUGLAS ENSMINGER and T. WILSON LONGMORE

This course is a study of the rural community with emphasis on group processes, leadership, organizations and institutions, social values, attitudes and customs, and the relationship of the community to non-local agencies and the great society.

## TRANSPORTATION AND TRAFFIC

**337. Principles of Transportation**

Fall, 3 credits

HAMPTON K. SNELL

Characteristics and economic principles of railway, highway, waterway, and air transportation. Transportation geography and principal commodity movements of the United States. Freight and passenger rate principles. Varieties of competition, cooperation, consolidation, coordination. Transportation labor re-

lations and financial problems. Interstate Commerce Act; principles of inter-state and intra-state regulation of railway, highway, waterway, and air transportation. Sources and interpretation of transportation data and information, particularly for Government employees.

### 652. Traffic Management Law

Fall, 3 credits

VICTOR I. GRUBER

This is a course designed to further the knowledge of those engaged in handling railroad traffic matters and covers the legal aspect of traffic problems involving car service, embargoes, transit, terminal services, pooling, claims and unreasonableness, discrimination and undue preference in rate making. Decisions of the Interstate Commerce Commission and the Federal Courts as they relate to the Interstate Commerce Act will be analyzed and discussed. This should enable those interested or actively engaged in transportation traffic matters to obtain a working knowledge of the law of interstate commerce as it is interpreted and applied by the Interstate Commerce Commission.

Prerequisite: A fair knowledge of rates, tariffs and services of the rail carriers. If in doubt concerning qualifications, consult instructor.

### 601. Traffic Management

Spring, 3 credits

GEORGE A. FULLER

A course designed to acquaint transportation students with the principles and practices of traffic management from both governmental and commercial points of view. It includes freight rate administration and procedure; preparation and filing of freight clauses; routing of traffic; tracing and expediting; and procedure before carrier organizations and government regulatory commissions. Current developments (ODT procedure, etc.) in the field of traffic are stressed.

### 653. Fundamentals of Freight Rates, Tariffs and Services

Spring, 3 credits

VICTOR I. GRUBER

This is a course that is intended to appeal to those who are interested in learning the basic fundamentals concerning freight rates, rate territories, rate bureaus, car services, terminal services, routing, fourth-section, pick-up and delivery service and a careful analysis of the freight classifications of rail, motor and water carriers.

In addition there will be discussed tariff construction and tariff rules of rail, motor, water and air carriers. Existing rail, motor, water and air tariffs will be constantly referred to by students who will be given problems regularly to work out.

### 651. Problems of Commercial Air Transportation

Fall, 3 credits

GEORGE A. FULLER

A practical course in the organization, services, charges and regulation of domestic and international air transportation. It includes the study of the development of aviation and air transportation, air mail, express, cargo and passenger traffic and charges; also the aid and development of commercial air transportation and government regulation of air carriers.

## AGRICULTURAL EDUCATION

### 795. Extension Thesis

Fall, 6 credits when approved. Repeated in Spring

M. C. WILSON

An opportunity will be afforded to qualified persons who desire to undertake a study of an agricultural extension problem and to submit a thesis. The amount of credit, to be determined by a thesis committee, will be based upon the nature of the problem, amount of work, and quality of the thesis.

**796. Extension Education**

Fall, 6 credits. Repeated in Spring

FREDERICK P. FRUTCHEY

This course is designed for students from other countries who are studying Extension work. The origin, purposes, and organization of Extension work are discussed, as well as steps in program building, Extension methods, local voluntary leadership, supervision and measuring results. Principles of education, psychology and sociology are explained.

Prerequisite: Open only to foreign interns in the Department of Agriculture.

Note: *Other courses usually offered in Extension Education are deferred until further notice.*

## Faculty

*Note: This list includes only those faculty members scheduled to teach during the year 1945-46.*

MANUEL I. ABELLA, Ph.D., University of Santo Tomas, Manila. Captain, Philippine Army Reserve. Taught in University of Santo Tomas and Howard University. (Languages and Literature)

J. K. ABLEITER, M. S., Wisconsin. Principal Soil Scientist, Bureau of Plant Industry, Soils, and Agricultural Engineering, USDA.\* Taught in North Dakota State Agricultural College. (Physical Sciences)

REYNOLD E. ASK, B.S., George Washington. Associate Photogrammetric Engineer, U. S. Coast and Geodetic Survey, Department of Commerce. Taught in George Washington University. (Engineering and Mechanical Arts)

LOUISE C. BARRY, J.D., California. Senior Stenographer, Office of Solicitor, USDA. (Office Techniques)

CONSUELO BATISTA, Secretary, Cuban Embassy. Taught in Escuela Normal para Maestras, Havana. (Languages and Literature)

MAGNA E. BAUER, Auguste Victoria Lyzeum, Berlin. Senior Censorship Clerk, Office of Censorship. (Languages and Literature)

GEORGE E. BEAUCHAMP, Ph.D., Northwestern. Executive Secretary, Inter-Agency Publications, Office of War Information. Taught in Manchester College, Northwestern and Nottingham Universities. (Languages and Literature)

BURNHAM P. BECKWITH, Ph.D., Economist, WPB Program and Statistics Bureau; formerly Associate Professor of Economics, University of Georgia. (Social Sciences)

R. O. BEEN, M.A., George Washington. Senior Agricultural Economist, Bureau of Agricultural Economics, USDA. (Social Sciences)

F. C. BISHOPP, Ph.D., Ohio State. Assistant Chief, Bureau of Entomology and Plant Quarantine, USDA. Taught in Colorado Agricultural College and University of Maryland. (Biological Sciences)

SIDNEY F. BLAKE, Ph.D., Harvard. Senior Botanist, Bureau of Plant Industry, Soils, and Agricultural Engineering, USDA. Formerly Professor of Botany, Stanford University. (Biological Sciences)

H. W. BLALOCK, Ph.D., Illinois. Principal Rate Investigator, Federal Power Commission. Taught in University of Arkansas. (Engineering and Mechanical Arts)

ANNA C. BOLTON, M.A., New York University. Training Specialist, Office of Fiscal Director, War Department. (Office Techniques)

C. VERNE BOWEN, M.S., Washington and Jefferson. Chemist, Bureau of Entomology and Plant Quarantine, USDA. Taught in Washington and Jefferson College. (Physical Sciences)

DANIEL M. BRAUM, B.S.A., Kansas State. Assistant Chief, Division of Training, Office of Personnel, USDA. (Office Techniques)

MARCUS GORDON BROWN, Docteur ès Lettres, Université de Dijon. Taught at University of Florida and Georgia School of Technology. Specialist, Inter-American Educational Relations, U. S. Office of Education. (Languages and Literature)

\* United States Department of Agriculture.

WILLIAM K. BROWNOLD, B.S.C., Southeastern. Chief, Accounting Division, Petroleum Administration for War. (Public Administration)

JAMES L. BUCKLEY, LL.B., Georgetown. Assistant Director of Personnel, USDA. (Public Administration)

WALTER G. CADMUS, JR., B.S., Kansas. Agricultural Engineer, Bureau of Plant Industry, Soils, and Agricultural Engineering, USDA. (Engineering and Mechanical Arts)

HERBERT O. CALVERY, Ph.D., Illinois. Chief, Division of Pharmacology, Food and Drug Administration, Federal Security Agency. Taught in Johns Hopkins University and University of Michigan Medical School. (Physical Sciences)

CHARLES F. CANNELL, M.A., Ohio State. Head, Field Section, Division of Program Surveys, Bureau of Agricultural Economics, USDA. Taught in Ohio State University. (Social Sciences)

ROSCOE H. CARTER, M.S., Iowa State. Chemist, Bureau of Entomology and Plant Quarantine, USDA. (Physical Sciences)

HARDEE CHAMBLISS, Ph.D., Johns Hopkins. Consulting Chemist and Chemical Engineer, Geophysical Instrument Company. Formerly Dean of School of Sciences and School of Engineering, Catholic University. (Physical Sciences)

DWIGHT W. CHAPMAN, Ph.D., Harvard. Acting Director, Civilian Surveys Division, Office of Civilian Requirements, War Production Board. (Social Sciences)

AARON H. CHUTE, Ph.D., Ohio State. Head Accountant, Regulatory Accounting Division, Office of Investigatory Services, USDA. Taught in Ohio State University and University of Minnesota. (Public Administration)

L. B. CLARK, B.S., California. Senior Mechanical Engineer, Radiation Research, Smithsonian Institution. Formerly Instructor of Electrical Engineering, University of California, and Physicist, San Francisco Research Laboratory. (Engineering and Mechanical Arts)

ALICE COFFMAN, Administrative Assistant, Bureau of Areas, Foreign Economic Administration. (Office Techniques)

M. ELDON COLBY, A.B., Nebraska. Chief, Actuarial and Analysis Division, Federal Crop Insurance Corporation. (Social Sciences)

RICHARD K. COOK, Ph.D., Illinois. Chief, Sound Section, National Bureau of Standards. Taught in University of Illinois. (Mathematics and Statistics)

JEROME CORNFIELD, B.S., New York University. Statistician, Bureau of Labor Statistics, Department of Labor. (Mathematics and Statistics)

CAREY G. CRUIKSHANK, A.B., King. Budget and Finance Officer, Office of Scientific Research and Development, Office for Emergency Management. (Office Techniques)

RAUL D'ECA, Ph.D., George Washington. Assistant Chief of Foreign Language Section, Press Unit, Office of Inter-American Affairs. Taught in George Washington. (Languages and Literature)

W. EDWARDS DEMING, Ph.D., Yale. Adviser in Sampling, Bureau of the Budget. Taught in Universities of Wyoming, Colorado, and Yale University. Special lecturer, National Bureau of Standards. (Mathematics and Statistics)

L. E. DONALDSON, Assistant Chief, Communications Division, in charge of Records Management, Office of Plant and Operations, USDA. Fifteen years' experience in records management work. (Office Techniques)

JOSEPH L. DOOB, Ph.D., Harvard. Mathematician, Naval Operations. Taught in University of Illinois. (Mathematics and Statistics)

LAURA GLENN DOUGLAS, B.F.A., College for Women, S. C. Studied at the Art Student's League, National Academy of Art, Ecole des Beaux Arts, Hofmann School of Art, Instituto di Belli Arti. Engineer draftsman, U. S. Navy. Lectured and taught art in Paris, New York, and Washington, D. C. (Art)

ERWIN R. DRAHEIM, Ph.D., Cornell. Senior Training Officer, Office of Personnel, USDA. Taught in Cornell and South Dakota State College. (Public Administration)

WILLIAM L. DYE, C.P.A., Senior Accountant, Regulatory Accounting Division, Office of Investigatory Services, USDA. (Public Administration)

GEORGE L. EDICK, Chief Draftsman, Bureau of Agricultural and Industrial Chemistry, USDA. (Engineering and Mechanical Arts)

EVERETT E. EDWARDS, M.A., Harvard. Agricultural Historian, Bureau of Agricultural Economics, USDA. Taught in Northwestern University; also summer sessions in University of Missouri, and Miami and Catholic Universities. (Social Sciences)

TAGE U. H. ELLINGER, D.Sc., Harvard. Engaged in private research work. Taught in University of Copenhagen, and Nääs College (Sweden). (Biological Sciences)

WALTER B. EMERY, Ph.D., Wisconsin. Special Assistant to Commissioner, Federal Communications Commission. Taught in University of Oklahoma, University of Wisconsin, and Ohio State University. (Languages and Literature)

DOUGLAS ENSMINGER, Ph.D., Cornell. Principal Social Scientist, Bureau of Agricultural Economics and In Charge, Rural Sociology Extension Work, Extension Service, USDA. Taught in Cornell. (Social Sciences)

NAOMI H. EVANS, B.S., Grove City College; graduate study, University of Pittsburgh. Associate Training Specialist, Army Air Forces, War Department. (Office Techniques)

ROBERT R. EVANS, M.A., George Washington; graduate study, American. Executive Officer, Foreign Funds Control, Treasury Department. (Office Techniques)

W. D. EVANS, B.S., Clarkson. Chief, Productivity and Technological Development Division, U. S. Bureau of Labor Statistics. (Mathematics and Statistics)

MORDECAI EZEKIEL, Ph.D., Brookings. Economic Adviser, Office of the Chief, Bureau of Agricultural Economics, USDA. Taught in Minnesota and Cornell. (Social Sciences)

WARD W. FETROW, Ph.D., Wisconsin. Associate Chief, Cooperative Research and Service Division, Farm Credit Administration, USDA. Taught in Kansas State College and Oklahoma A. & M. College. (Social Sciences)

E. J. FINAN, Ph.D., Ohio State. Associate Professor, Catholic University. (Mathematics and Statistics)

BERNARD P. FOOTE, B.S.S., Bowling Green. Assistant Clerk Stenographer, Board of Immigration Appeals. Taught in Union College. (Office Techniques)

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LESTER FRANKEL, M.A., Columbia. Medical Statistics Division, Bureau of Medicine and Surgery, Navy Department. Lecturer in Statistics, American University. (Mathematics and Statistics)

LOUIS H. FRANKEWICH, LL.B., Washington College of Law. Attorney; formerly Chief, Distribution Branch, Office of Price Administration. (Languages and Literature)

FREDERICK P. FRUTCHEY, Ph.D., Ohio State. In charge, Foreign Students Program, Division of Field Studies and Training, USDA. Taught in Ohio State University and University of Missouri. (Social Sciences)

GEORGE A. FULLER, M.A., Iowa. Traffic Representative, United Airlines. Formerly Senior Transportation Economist, Headquarters AAF; Transportation Industrial Specialist, WPB. Taught in University of Toledo. (Social Sciences)

HARRIET GARRELS, M.A., George Washington. Art Supervisor, Public Schools, District of Columbia. Taught in Abbott Art School and Wilson Teachers College. (Engineering and Mechanical Arts)

ENRIQUE A. GIRO, Doctor in Social, Political, and Economic Sciences, National University of Cuba. Associate Foreign Language Editor, Office of the Coordinator of Inter-American Affairs. Director of "Academia Giro" for five years. Taught in Inter-American Training Center. (Languages and Literature)

MEYER A. GIRSHICK, M.A., Columbia. Statistician, Bureau of Agricultural Economics, USDA; on leave as Mathematical Statistician, Statistical Research Group, Division of War Research, Columbia University. Taught Columbia University. (Mathematics and Statistics)

EARL R. GLOVER, M.S., Texas. Commercial Specialist, Office of Supply, Commodity Credit Corporation, USDA. Taught at Texas A. & M. College. (Biological Sciences)

EDWARD H. GRAHAM, Ph.D., Pittsburgh. Chief, Biology Division, Soil Conservation Service, USDA. Taught in University of Pittsburgh. (Biological Sciences)

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PHILIP L. GREEN, Latin American Specialist, Office of Foreign Agricultural Relations, USDA. Four years' residence and travel in Latin America. Taught Latin American civilization in Inter-American Institute of Roerich Museum, New York; College of City of New York; American University; summer session, University of Maryland. (Social Sciences)

ROMAIN C. GREENE, M.A., Drake. Taught in Bethany College and University of Maryland. Instructor in English, University of Maryland. (Languages and Literature)

PAUL L. GRIGAUT, Licencié-ès-Lettres, Sorbonne; Diplomé Ecole du Louvre. Principal Translator, Department of State. Taught in University of New Hampshire. (Languages and Literature)

INEZ L. GRISWOLD, M.A., Peabody. Specialist in Training Techniques, Division of Visual Aids, U. S. Office of Education. Taught in Marion College, Bethany College, and George Peabody College for Teachers. (Office Techniques)

VICTOR I. GRUBER, Assistant Director, Division of Rates, Office of Defense Transportation. Formerly Chief of Tariffs and Rates, Reading Company. (Social Sciences)

R. G. HAINSWORTH, M.A., American. Economic Geographer, Office of Foreign Agricultural Relations, USDA. (Mathematics and Statistics)

ROY H. HALQUIST, C.P.A., LL.M., National. Contract Termination Specialist, Procurement Policy Division, War Production Board. (Public Administration)

WALTER J. HAMER, Ph.D., Yale. Chemist, National Bureau of Standards, Department of Commerce. Taught in Juniata College, Catholic University, and Yale. Research Associate, Massachusetts Institute of Technology; Research Fellow, Yale. (Physical Sciences)

CARL H. HANSON, B.S., Wisconsin. Formerly Specialist in Visual Instruction, Extension Service, USDA. Thirty years' experience in lecturing and teaching, primarily in visual instruction, including photography. (Engineering and Mechanical Arts)

SUSAN E. HARMAN, Ph.D., Johns Hopkins. Professor of English, University of Maryland. (Languages and Literature)

PHILIP M. HAUSER, Ph.D., Chicago. Assistant Director, Bureau of the Census. Taught in University of Chicago. (Social Sciences)

HAROLD HEDGES, M.A., Nebraska. Acting Chief, Cooperative Research and Service Division, Farm Credit Administration, USDA. Taught in Kansas State College and the University of Nebraska. (Social Sciences)

HENRY G. HERRELL, LL.B., National. Assistant Deputy Director for Management, Office of Marketing Services, USDA. (Office Techniques)

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HARRY B. HUMPHREY, Ph.D., Minnesota. Principal Pathologist (retired), Bureau of Plant Industry, Soils, and Agricultural Engineering, USDA. Taught in Stanford University, Hopkins Marine Station, Washington State College. Member, Cercle Français, D. C. (Languages and Literature)

WILLIAM HURWITZ, M.A., Columbia. Senior Statistician, Bureau of the Census. (Mathematics and Statistics)

A. J. JAFFE, Ph.D., Chicago. Statistical Analyst, War Department. Taught in University of Chicago. (Mathematics and Statistics)

J. J. A. JESSEL, D.Sc. in E.E., Harvard. Senior Electrical Engineer, Federal Power Commission. (Engineering and Mechanical Arts)

CHARLES B. JOHNSON, M.A., Illinois; M.S., California Institute of Technology. Assistant Meteorologist, Weather Bureau. (Physical Sciences)

V. W. JOHNSON, Ph.D., Wisconsin. Head, Division of Land Economics, Bureau of Agricultural Economics, USDA. Taught in University of Maryland, North Dakota Agricultural College, and Syracuse University. (Social Sciences)

MARJORIE C. JOHNSTON, Ph.D., Texas. Specialist in Spanish, U. S. Office of Education. Taught in University of Texas (summer sessions) and Stephens College. (Languages and Literature)

W. A. JUMP, Director of Finance and Budget Officer, USDA. Lecturer, American University. (Public Administration)

MILTON KAUFMAN, M.S., College of City of New York. Economist, Foreign Trade Division, Bureau of the Census. (Mathematics and Statistics)

WILLIAM A. KILGORE, Ph.D., Columbia. Instructor of Physics, Wilson Teachers College. (Physical Sciences)

J. K. KNUDSEN, LL.M., Commerce Counsel, Office of the Solicitor, USDA. (Public Administration)

W. E. KONECZNY, M.S.E., Michigan. Aircraft Specialist, Civil Aeronautics Board. Taught in University of Michigan and Columbia Technical Institute. (Engineering and Mechanical Arts)

SOFIA KRISILLAS, Graduate, Normal School, Panama City. Attended Johns Hopkins University, 3 years. Taught in private schools. (Languages and Literature)

LOUIS J. KROEGER, M.A., California. Director, Administrative Services, Office of Price Administration. Formerly lecturer, University of California. Ten years of administrative and consulting experience in public personnel administration in state and local government. (Public Administration)

SOLOMON KULLBACK, Ph.D., George Washington. Lieutenant Colonel, Office of the Chief Signal Officer, War Department. Taught in George Washington University. (Mathematics and Statistics)

PIETRO LAZZARI, Master Artist, Ornamental School of Rome. Belle Arti. Portrait artist; landscape painter, and graphic designer. (Art)

MAX LEDERER, Ph.D., University of Vienna, Austria. Fellow in education and German language and literature, Reference Department, Library of Congress. Taught in Municipal Teachers College, Vienna, and Coe College. (Languages and Literature)

MORRIS C. LEIKIND, M.S., Ohio State; graduate study at Johns Hopkins. Associate Fellow in Medicine and Biology, Library of Congress. Taught in Ohio University. (Biological Sciences)

MICHAEL LEVER, Doctor en Filosofia y Letras, University of Madrid. Chief, Editorial and Review Section, Publications Division, Civil Aeronautics Administration. Taught in Ciudad Universitaria, Madrid. (Languages and Literature)

VERNE B. LEWIS, M.A., Minnesota. Lieutenant, USNR, Management Engineer's Office, Navy Department; on leave as Assistant to the Director of Finance, USDA. (Public Administration)

R. K. LINSLEY, B.S., Worcester Polytechnic. Hydrologic Engineer, U. S. Weather Bureau. (Physical Sciences)

JOHN T. LOKERSON, B.S., George Washington. Instructor of Navigation, U. S. Power Squadrons. (Physical Sciences)

T. WILSON LONGMORE, M.A., Louisiana State. Social Science Analyst, Bureau of Agricultural Economics, USDA. (Social Sciences)

BLAKE M. LORING, D.Sc., Massachusetts Institute of Technology. Metallurgist, U. S. Naval Research Laboratory. Taught in Massachusetts Institute of Technology. (Physical Sciences)

W. J. LYNOTT, E.E., Rensselaer Polytechnic. Engineer, Federal Power Commission. (Engineering and Mechanical Arts)

ALLEN MANVEL, A.B., Occidental; graduate study, Chicago; Littauer Fellow, Harvard, 1939-40. Principal Administrative Analyst, Bureau of the Budget. (Public Administration)

FRITZ MORSTEIN MARX, Ph.D., Hamburg. Administrative Analyst, Bureau of the Budget. On leave from Department of Political Science, Queens College. (Social Sciences)

CHARLES N. MASON, M.A., Montana. Chief, Division of Accounts, Office of Budget and Finance, USDA. Taught at State University of Montana. (Public Administration)

JACOB H. MASON, B.A., George Washington. Chief, Employee Relations Branch, Civilian Personnel Division, Office of the Secretary of War. (Public Administration)

ARTHUR B. MCLEAN, M.A., Alabama; graduate study, North Carolina and American. Director of Personnel, Federal Security Agency. Taught in University of Alabama, Brenau College, North Georgia College, and George Washington University. (Public Administration)

M. C. MERRILL, Ph.D., Washington University (St. Louis). Chief of Publications, Office of Information, USDA. Taught in Missouri Botanical Gardens in St. Louis, Idaho Technical Institute, Utah Agricultural College, and Brigham Young University. (Languages and Literature)

FRANCES HOWE MILLER, M.A., Missouri. Instructor of English, University of Maryland. (Languages and Literature)

JOHN D. MILLETT, Ph.D., Columbia. Lieutenant Colonel, Control Division, Hq., Army Service Forces, War Department. Taught in Columbia and Rutgers Universities; co-author of *Federal Administrators*. (Public Administration)

VERNA C. MOHAGEN, M.A., George Washington. Assistant Chief, Personnel Management Division, Soil Conservation Service, USDA. (Office Techniques)

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MADALINE WALLIS NICHOLS, Ph.D., California. Associate Professor of History and Spanish, Goucher College. (Languages and Literature)

CHARLES B. NUTTING, S.J.D., Harvard. Associate Solicitor in Charge of Food Distribution, Office of the Solicitor, USDA. Taught in Universities of Nebraska and Texas. (Public Administration)

RUBERTA M. OLDS, M.A., Columbia; student, University of Mexico. Chairman, Department of Spanish, American University. Also taught in State Teachers College, South Dakota; Escuela Normal, Chile, South America. (Languages and Literature)

JEAN PAJUS, Ph.D., Paris. Chief Economic Analyst, Foreign Economic Administration. Taught in Universities of Melbourne and Sydney, Australia; Cleveland College; and University of California. (Social Sciences)

ARTHUR C. PARSONS, M.A., Maryland. Assistant Professor of Foreign Languages, University of Maryland. (Languages and Literature)

ARTHUR S. PATRICK, M.A., Iowa. Assistant Professor of Business Administration, University of Maryland. (Office Techniques)

SALLIE M. PEASE, A.B., California. Taught in Stanford and George Washington Universities. (Office Techniques)

JOSEPH PONTI, M.A., Stanford; graduate study, Freiburg, Besancon, and Bologna. Foreign Broadcast Editor, Foreign Broadcast Intelligence Service, Federal Communications Commission. (Languages and Literature)

O. A. POPE, Ph.D., Iowa State. Agronomist, Bureau of Plant Industry, Soils, and Agricultural Engineering, USDA. Taught in Universities of Delaware and Arkansas. (Mathematics and Statistics)

HESTER B. PROVENSEN, LL.B., George Washington. Assistant Professor of Speech, University of Maryland. (Languages and Literature)

ELBRIDGE C. PURDY, Assistant Chief, Photographic Section, Office of Plant and Operations, USDA. Twenty-five years' general photographic experience. (Engineering and Mechanical Arts)

C. M. PURVES, M.A., Minnesota. Principal Agricultural Economic Statistician, Office of Foreign Agricultural Relations, USDA. Taught in Texas A. & M. College. (Mathematics and Statistics)

GEORGE L. RIDGEWAY, B.Litt., Oxford. Analyst, Division of Public Liaison, Department of State. Taught in Hamilton College and Wells College. (Social Sciences)

MARY-CARTER ROBERTS, A.B., Marietta. Book Editor, Washington *Evening Star*. Extensive experience in writing and lecturing as a book critic; formerly on staff of New York *Sun* and *Herald-Tribune*. (Languages and Literature)

KENNETH W. ROSS, B.S., Dartmouth; C.E., Thayer School of Engineering. Senior Engineer, Federal Power Commission. Hydroelectric Planning and Design, T.V.A. (Engineering and Mechanical Arts)

JOHN ROSSETTI, M.A., New York University; Certificat D'Etudes, University of Paris. Senior Foreign Broadcast Monitor, Federal Communications Commission. Taught in New York University and Sweet Briar College. (Languages and Literature)

WILLIAM H. ROWE, M.S., Kansas State. Chief, Program Division, Federal Crop Insurance Corporation, USDA. Taught in Kansas State College and University of Akron. (Public Administration)

LEOPOLDO T. RUIZ, Ph.D., California. Associate Economic Analyst, Foreign Economic Administration. Taught in National Teachers College, Manila, and Universities of Manila and Philippines. (Social Sciences)

JOHN C. RUSSELL, Ph.D., Stanford. Principal Administrative Analyst, Bureau of the Budget. Taught in Stanford and Syracuse Universities. (Public Administration)

GEORGE M. SAHAROV, A.B., California at Los Angeles; graduate study, California, American, and Harvard; graduate of Classical Gymnasium, Tula, Russia. Statistician, Department of Labor. Taught in University of Southern California and private instruction according to Russian Gymnasium program, Shanghai, China. (Languages and Literature)

VERNE L. SAMSON, A.B., Washington State; graduate study, California and Radcliffe. Training and Employee Relations Advisor, Personnel Division, Federal Public Housing Authority. Taught in Whitworth and Washington State College. (Office Techniques)

EMIL SCHELL, M.A., Western Reserve. Chief, Cost of Living Index Section, Bureau of Labor Statistics, Department of Labor. (Mathematics and Statistics)

RAINER W. SCHICKELE, Ph.D., University of Berlin, College of Agriculture. Principal Agricultural Economist, Office of Requirements and Allocations, USDA. On leave as Associate Professor of Economics, Iowa State. (Social Sciences)

E. J. SCHLATTER, B.S., Pennsylvania State. Associate Civil Engineer, Cartographic Division, Soil Conservation Service, USDA. (Engineering and Mechanical Arts)

EDGAR A. SCHULER, Ph.D., Harvard. Taught at Louisiana State University. Senior Social Scientist, Bureau of Agricultural Economics, USDA. (Social Sciences)

ERIC T. SCHULER, B.S.L., Columbia. Associate Research Analyst, Office of Strategic Services. Taught in Cornell University. (Languages and Literature)

ALEXANDER L. SHANDS, B.S., College of City of New York. Associate Meteorologist, Hydrometeorological Section, Weather Bureau. (Physical Sciences)

JASPER B. SHANNON, Ph.D., Wisconsin. Assistant Director, Graduate School, USDA. Professor of Political Science, on leave University of Kentucky. Taught in Transylvania, Kentucky, Wisconsin. (Social Sciences)

LAWRENCE SHAW, M.A., Pennsylvania. Industrial Engineer, Ammunitions Division, Ordnance, War Department. Taught in Ohio State. (Mathematics and Statistics)

LESLIE E. SIMON, B.S., U. S. Military Academy, M. I. T. Director of Ballistic Research Laboratory, Aberdeen Proving Grounds. (Mathematics and Statistics)

C. T. SMITH, Records Management and Procedure Analyst, Office of Plant and Operations, USDA. (Office Techniques)

HAMPTON K. SNELL, Ph.D., Yale. Assistant to the Vice President in Charge of Research, Association of American Railroads; on leave as Assistant Director in Charge of Research, Army Industrial College. Taught in Universities of Montana and Southern California. (Social Sciences)

S. A. SNYDER, Assistant to the Director, Procurement Division, Treasury Department. (Public Administration)

STANLEY A. SOKOLOFF, Associate Materials Engineer (textiles), U. S. Maritime Commission. Formerly Consulting Textile Technologist. (Engineering and Mechanical Arts)

H. M. SOUTHWORTH, A.B., Cornell. Agricultural Economist, Office of Marketing Services, USDA. (Social Sciences)

O. GLENN STAHL, Ph.D., New York. Assistant Director of Personnel, Federal Security Agency. Taught in New York University and extension instructor, University of Tennessee. (Public Administration)

J. GORDON STEELE, Ph.D., Ohio State. Senior Soil Scientist, Soil Conservation Service, USDA. Seven years' experience at Ohio Agricultural Experiment Station. (Physical Sciences)

JOSEPH STEINBERG, B.S., College of City of New York. Resident Collaborator, Statistical Laboratories, Iowa State College, 1944. Statistician, Bureau of the Census. (Mathematics and Statistics)

MILDRED R. STEPHENS, B.S. in Secretarial Science, Alabama College. Training Officer, Bureau of Ships, Navy Department. (Office Techniques)

J. STEVENS STOCK, M.A., American. Lt. (j.g.), U. S. Navy; Head, Statistics Section, Shore Establishments and Civilian Personnel, Navy Department. Lecturer in Statistics, American University. (Mathematics and Statistics)

AFIF I. TANNOUS, Ph.D., Cornell. Associate Social Science Analyst, Office of Foreign Agricultural Relations, USDA. Taught in University of Beirut, St. Lawrence and Cornell Universities. (Languages and Literature, and Social Sciences)

EUGENIA TARAKUS, education in Russian gymnasium and University of Liege. On staff of Library of Congress. (Languages and Literature)

CONRAD TAEUBER, Ph.D., Minnesota. Special Assistant to the Chief, Bureau of Agricultural Economics, USDA. Taught in University of Minnesota, University of Wisconsin, and Mt. Holyoke. (Social Sciences)

IRENE B. TAEUBER, Ph.D., Minnesota. Research Associate, Office of Population Research, Princeton University. Taught in University of Minnesota, University of Missouri, Stephens College. (Social Sciences)

CARL C. TAYLOR, Ph.D., Missouri. Head, Division of Farm Population and Rural Welfare, Bureau of Agricultural Economics, USDA. Taught in Universities of Texas, Missouri, North Carolina State College of Agriculture, Brookings Institution, and Catholic University. (Social Sciences)

BENJAMIN J. TEPPING, Ph.D., Ohio State. Statistician, Bureau of the Census. Taught in Ohio State University. (Mathematics and Statistics)

VALERY J. TERESHENKO, Engineer of Economics, State Commercial Institute, Prague. Acting Chief, Eastern European Branch, UNRRA. Taught in Cooperative Institute, Prague. (Social Sciences)

SIDNEY TEWELES, JR., M.S., Marquette; Certificate in Meteorology, University of Chicago. Analyst, Weather Bureau. Taught in University of Chicago. (Physical Sciences)

FREDERICK L. THOMSEN, Ph.D., Wisconsin. Head, Division of Marketing and Transportation Research, Bureau of Agricultural Economics, USDA. Formerly Assistant Professor of Agricultural Economics, Kansas State College, and Professor of Agricultural Economics, University of Missouri. (Social Sciences)

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